

OFF ROAD CYCLING



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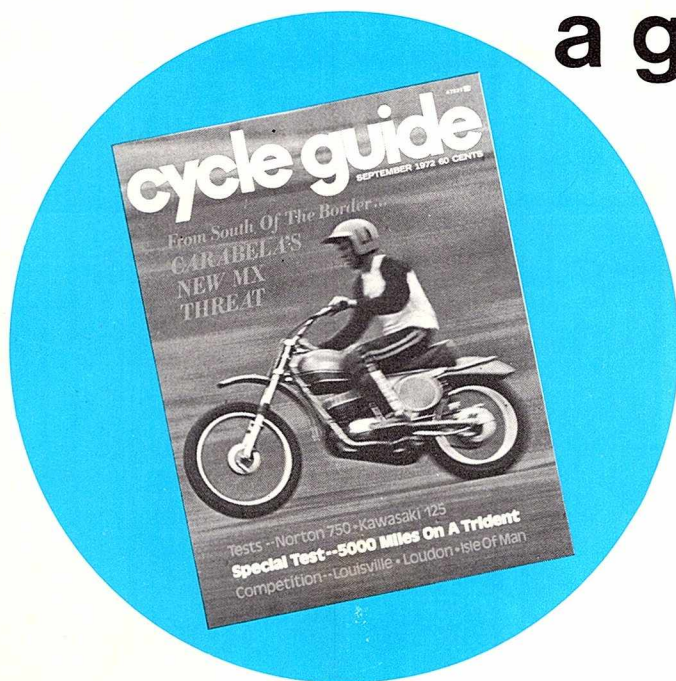
Motocross: The New "In" Sport

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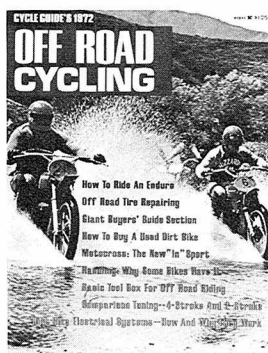
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HOW TO RIDE A MOTOCROSS

Most guys don't win because they're not ready to. Here's a look at how you can consistently finish on top through preparation.

You would probably be surprised at how many Sunday motocross races are won on Wednesday or Thursday, unless you're already familiar with the effort and advance preparation necessary to be a winner. If you *do* have your racing program that well together, chances are that you are pretty successful. Because if you haven't already found it out, you soon will. Serious motocross has reached the point that you can't just back last week's bike off the trailer and win with it. You have to put considerable time into getting *you* and your motorcycle into condition for the races.

Let's take a brief look at how you might put a successful program together and what to do with the pieces when you get them.

YOUR MOTORCYCLE

Of course, the main components are *you* and *the motorcycle*. Both are essential, but all else being equal, the bike is probably most important. You'll find that no matter what condition you are in, you would have trouble finishing a 45 minute moto without the bike.

By this time, you will have already chosen your motorcycle from the wide variety of models and makes available, and decided what size, or sizes you want to race. It should go without saying that you should not be on a bike that you can't handle, either because of *its* size, or *your* experience. But you still see some guys with too much motorcycle that they are not equipped to handle, and they stay in trouble.

Use your head. Have a motorcycle that you can control, learn to ride it properly, and get as much time in on it that you can. There is plenty of opportunity, between the Expert sponsored motocross schools and the many Junior programs, to get a good basic foundation. It's important for your safety, and in fairness to the other racers, that you be ready before you go out to race. In racing, you can



Hand and arm strength is most important in motocross. The fingertip push-up helps strengthen the all important grip.

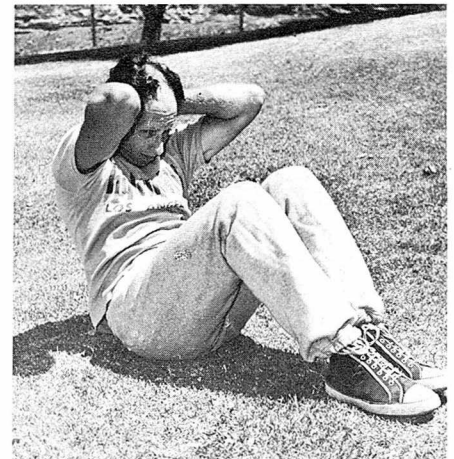


The chin-up helps develop the shoulders and arms. Doing it the forehand method as shown here is best.

not only hurt yourself if not prepared, but take others out with you. And you know that *you* wouldn't want some "ham fist" taking you out because he was in over his head.

As far as any tricks or souping up for your bike, you're just as well off not fooling with it. You'll find that when you get on a racing bike, that you probably won't be able to go as fast as the motorcycle will, without landing on your tail.

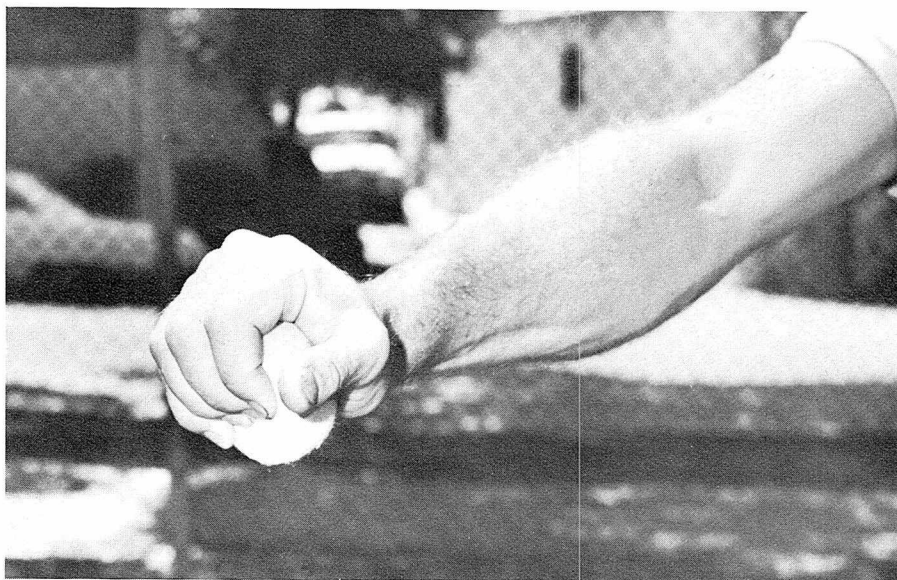
Find out what makes the bike tick and know how to work on it, because you'll find that for most of your racing



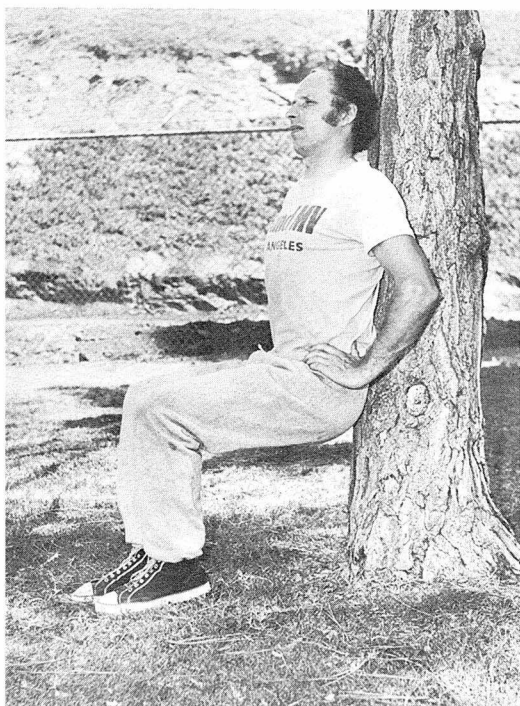
The abdominal curl (sit-up with knees bent) is more effective than the straight sit-up. Your stomach has to pull you up while your legs do most of the work on a sit-up. Stomach keeps you together.

career, that you will probably be the chief mechanic.

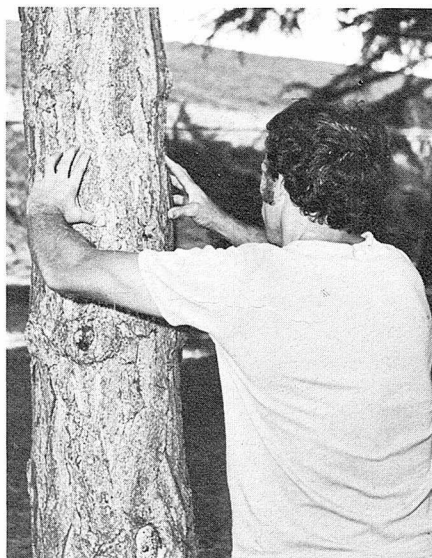
The time to get the motorcycle ready for Sunday is during the week. Sometimes it's tough between work and school, but don't wait until Saturday night or Sunday morning to get it together, you might find that it's too late. As early in the week as possible, clean the bike off well, (heavily caked mud can cleverly conceal broken parts) make the necessary adjustments or replacements, and if you're lucky and have done your job well, all you'll have to worry about at the



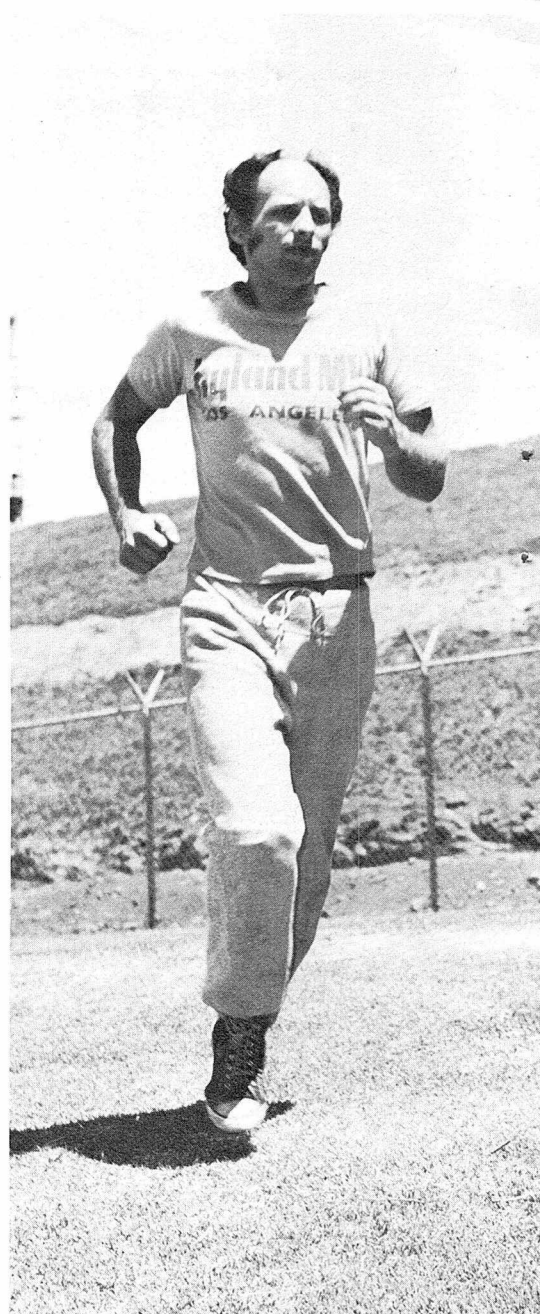
While there are grip exercisers you can buy, almost anything you can squeeze, as this old tennis ball, will work. You can work on your grip any time of the day.



Your legs act as a second set of shocks. This isometric takes the place of squats with weight. Just push against any solid object as if to move it.



Trying to squeeze through the tree or a wall accomplishes the same thing as curls with a set of weights. More importantly, it's cheaper.



Running will help your general condition. It helps your legs and will give you the crucial endurance you'll need around that third moto.

races on Sunday are such things as tire pressure, plugs and fuel.

You'll be way ahead by loading on Saturday and leaving plenty of time to get to the races on Sunday. Don't forget the traffic, sign-ups, finding a pit and leaving time for practice.

YOU

At the same time that you are getting your bike in shape for Sunday, you must also be getting yourself ready. How you do this may vary according to your racing schedule, the time of the year, and the part of the

country in which you live. But usually what it boils down to is just plain hard work. Ideally you can get in condition and stay there by riding. But many times you are only able to ride on the week-end. This means that you have to simulate riding in some way, and the way to do that is through an exercise program. Fortunately, such a program can cost nothing but some time.

If you already have a set of weights, or access to them, fine. But if not, the isometric program that we show here will work beautifully and along

with some running will keep you quite fit. Again, how much you need will depend on your individual needs, and remember, there are no short cuts, it is hard work. Your physical condition can't be stressed enough. So many times you'll see our riders in International competition just wilt in the saddle while the Europeans pull steadily away. To be successful in motocross it is necessary to be dedicated to it and work hard at it. There are no magic pills, just sweat. Remember too that you are not out to build a lot of muscles, just the strength



If you've done your preparation well at home, all you should have to worry about at the track is such things as your plug, tire pressure and fuel. Hopefully.

Here's an example of starting form. An in-gear start, the weight is forward and the rider's intently watching for the flag to fall. The rider's away and as you can see, the front of the bike came up a bit, but with the weight forward, he is quickly bringing it back down.



to ride the motorcycle long and hard. Your grip, hand and arm strength, legs and stamina, are the important considerations in a conditioning program.

RIDING TECHNIQUE

Assuming that you have yourself and your bike ready, let's take a look at a course, some of the things that you are almost sure to encounter, and how you can best handle them.

1) *Starting.* There are two or three methods of starting races and the race

organizers will be in charge of that, but most basically, there are in-gear and out-of-gear starts. A lot of courses are going to the starting gate now. This consists of iron bars the width of the starting area. The bikes stay behind this gate until it falls, then ride out over it and are on their way. This is an in-gear start and the trick here is to keep your eye on the top bar to watch for it to start to fall.

Some tracks still use the out-of-gear start. This is where you are required to have your clutch hand on your helmet, and as the flag falls, to put

the bike in gear and go.

In both of the basic starting positions, the idea is to keep your weight forward and your foot poised near the shifting lever. You'll find that the bike will have a tendency to come up on you. You won't be able to stop it, but must control it so that you can get it back on the ground and going as quickly as possible. Try to anticipate the start without cheating.

2) *Cornering.* There are a couple of basic ideas in cornering. One of these ideas is to have already set the corner up as to what gear you will be using.

Here are two examples of uphill form. The rider is standing, this is usually used on short, steep hills. The rider has chosen to sit, as he would on a long, gradual hill.



Downhill form is just about the same as uphill, in reverse. Here the rider is sitting for a fast downhill.



Be in that gear *before* you get to the corner. How fast you are able to go through depends on the make-up of the corner and the surface. For many corners, it will be necessary to put your foot down. Here the weight is forward and the foot is well forward and parallel with the bike. As soon as possible get both feet back on the pegs and go for the next turn.

If it is a high banked turn, there may be a berm you can ride. As you hit the berm, you dial it on and power out. The surface will have much to say about how you handle the berm.

The berm is the most spectacular way of taking a high bank, but it's not always the quickest, and the quickest around the course wins. Taking the inside may save you valuable time.

This brings up the other major point about cornering, and that is to be sure that you have an alternate line through the corner. You may go in and find that someone already has your line blocked, in this case have another one ready.

Hair-pin turns are obviously taken carefully, and the other turn you may run across is the "off camber". This

is the turn that instead of being banked, slopes away from you. On the off camber, lean the bike into the hill and cut in as closely as you can. And tough as it is on controlling the bike, keep your fingers crossed!

3) *Uphills.* You may run into a variety of uphill and your form will vary as to their steepness and length. If the hill is long and not too steep, you may want to take it sitting down. For a shorter, steeper hill, you may find yourself coming up some in the saddle. A lot depends on your comfort and preference here too. We could



This is an example of cornering technique. The rider is setting up his line, he is already in the gear he has chosen for this corner. The weight is forward and the foot is extended and parallel with the bike. It should be well forward. The corner has been negotiated and now it's feet back on the pegs and go! This is what happens if you should happen to "dial it on" a bit too much.



probably discuss downhills here too as the form is about the same and depends on your choice and the make-up of the hill. Some of them you won't believe.

4) *Jumps.* Jumping is very important in motocross as you will find at least one decent jump on each course, and sometimes several. Generally you will be rising in the saddle for the jump. If it is quick and flat you'll keep a "light" front wheel and zip over. Other jumps will be higher and really send you flying through the air. Again you'll stand on the approach, pull

back slightly and reduce the power as you become airborne, then land on the rear wheel and be "dialing" the power back on as you come down and prepare to continue. Obviously, these must be practiced and worked on extensively.

You will find uphill and downhill jumps too, and the basic form is the same, power on, pull back slightly, land on the rear, and continue. You can't afford to be lazy on the jumps, you must ride the motorcycle.

5) *Whoop-de-dooos.* These are fast bumpy sections of the course, not at

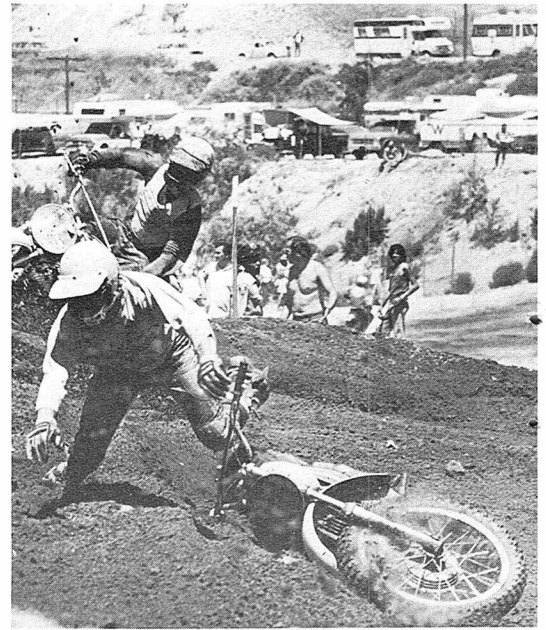
all unlike a roller coaster. The trick here is to keep a "light" front wheel, weight back and usually up in the saddle. Another trick is to try riding as much to the side of the course as possible. The middle of the track will be the worst, so if you can, avoid that part.

6) *Sand and mud.* We lump sand and mud together because the techniques for getting through them are somewhat similar. What you try to do is get the highest gear possible and dial it on through the stretch. Too low a gear will have you digging yourself

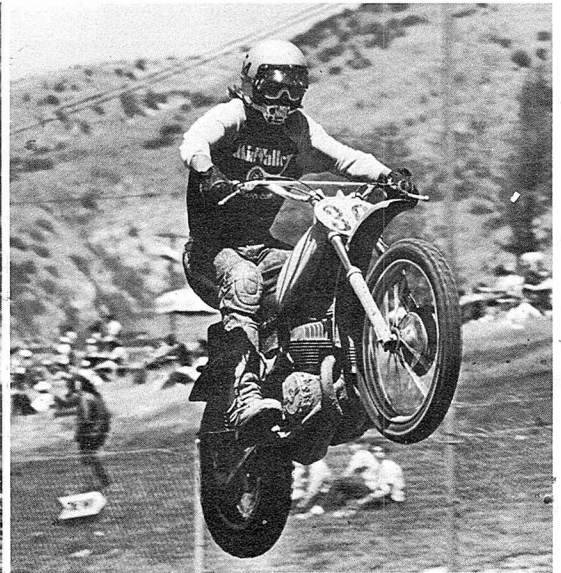


You may find the berm on the outside of a banked turn is the best way to get around. As you hit the berm, you power out, as shown here in good berm form.

Ideal jumping form is demonstrated in this sequence. The rider has come up on the pegs as he prepares the jump. In the air, pulling back gently on the bars, front wheel well up in preparation to land. Dialing the power back on as the bike comes down. The front wheel is coming back down so he can be on his way. If you don't take off with enough power, or are lazy in the air, you will come down on the nose wheel, and if you're lucky, you'll be able to save it.



This is an example of poor berm form. You can bet that whatever he did wrong, he'll try to correct next time!



a hole. So you'll want the weight up some and just go. Another thing to watch for in the mud, is that there will be ruts forming. Sometimes it is best to pick one of the existing ruts and go through this way.

7) *Water.* If there is no existing water, you can rest assured that the sponsor will provide some. This is always a high point for the spectators. How you take the water will depend a lot on the approach and the "far" bank. If the water is shallow and the approach flat, you may be able to dash over on the back wheel. You may

be able to attempt to jump the water. The big thing is to use your head and not roar in and drown yourself. The opposite bank will always become wet with the bikes trailing water and if it is steep, it can be tricky, watch for it.

RACE STRATEGY

Now that you can get yourself around the course, you'll have to concern yourself with being out there with forty other guys and this will entail some thinking, planning and gamesmanship. Let's see how you might go

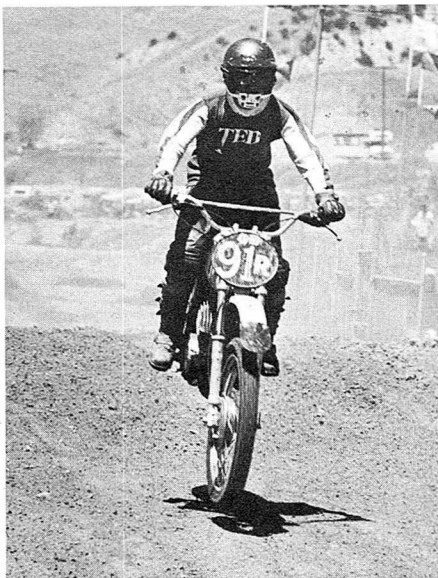
about it.

1) *Arrival and practice.* As we mentioned, it is important to be at the course early enough to set up your pits, check out your bike and practice. One important part of practice is to walk the course before you go out on it. This is most crucial if you've never seen the course, but even if it's a course that you ride every week, check it out. They are always changing them, and if you zig when you should have zagged, you'll be hurting.

Take only the practice that you need to become familiar with the



When going through "whoop-de-doo's," the fast rough sections, try to keep a "light" front wheel, as this rider, and hop across the tops. You sometimes come down in the depressions as #78, notice he is standing. Riding to the side of the course as he is reduces your chances of hitting bad bumps.



One of the hazards of riding motocross is the thick dust. About all you can do here is hope you don't get center punched.

course and get you and your bike warmed up. Don't leave your race in practice. You'll see some guys out there for the full hour or whatever, but you probably won't see them around the checkered flag.

Try and leave enough time to re-walk the course to see how it has changed with use. You can also get a line on how others are taking the corners. You must know what the other guy is doing so you can plan.

Never miss the rider's meeting. It is here that the length of the races and number of motos, along with any

rule changes is discussed. This will determine your strategy so don't miss it. And don't be the donkey who is pit racing during the rider's meeting so that nobody else can hear what is going on.

2) *Equipment.* There is a basic minimum that you should be wearing. Besides the required helmet (which you can't spend too much for), you should have a long sleeved shirt, stout trousers (leathers if possible), gloves, and good strong boots. Be sure that the boots are not steel toes, they can be dangerous if they are smashed.

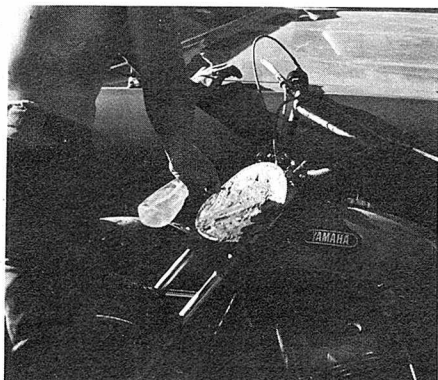
You should also at least start with goggles, though you may have to discard them during the race if they become muddy.

There are also some other protective items such as mouth guards, chest protectors, and leg guards that can help make the ride more comfortable and safe. But be sure that anything you wear is comfortable and that it fits. Don't wear anything just to look like a racer. That stuff can be a problem if it doesn't fit or you are not able to handle the bike with it on.

3) *The start.* At the starting area



You will almost always find mud somewhere on the course. Find the highest gear you can and then "dial it on."



After practice, and between motos, it would do well to clean the plates so you'll be sure to be scored.

The scoring ladies need all the help they can get to see the plates. Each rider is scored in all three motos and the most consistent wins!

you may be assigned a spot, or it will be the first one there style. You may find that you have some time so shut your engine off and relax. Don't sit there "blipping" the throttle for ten minutes like you'll see done.

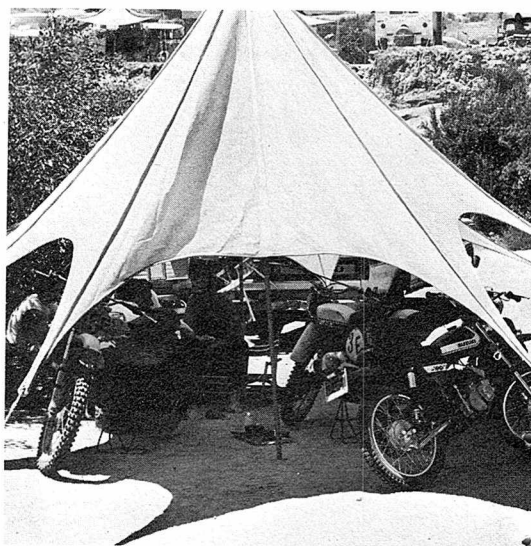
The start is always important, but the length of the race and the type of course will have a large bearing on this too. You want to be in good position without going wild. Watch out for yourself here, you will be in close quarters and must ride defensively.

4) *Turn One.* The first turn is



usually the most hectic and confused. Here again, if it is a short race on a tight course, you'll want to be well up. If it is a longer race on a faster course, you won't need to win the race on the first turn. The point is, don't go in over your head. Again, you have a responsibility to the other riders, not to take them out because you do something "freakish."

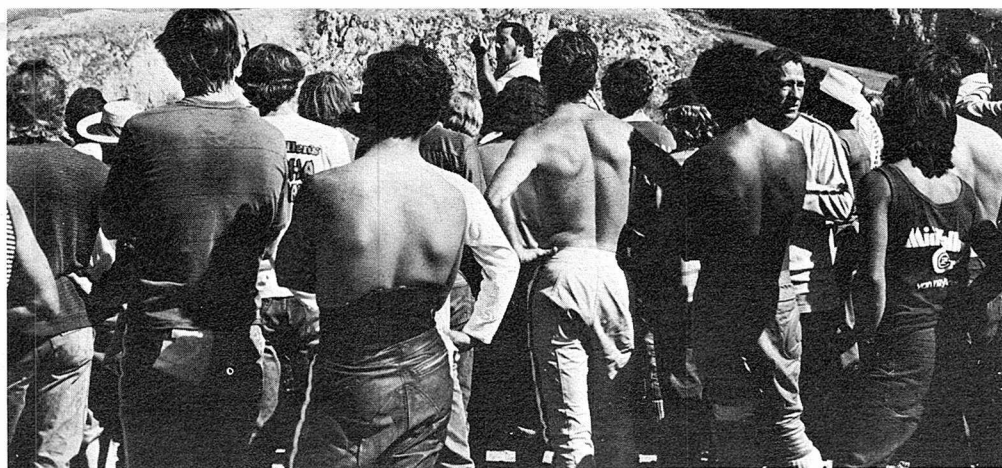
5) *Cornering.* As we said before, be sure and have your basic line set up along with a couple of alternates. If you used the practice period wisely you're in good shape. Watch what the



Don't fool around between motos, you'll need all the strength you can get. This group has it together with a shaded pit.

other guy is doing and in some cases leave some room in case he does something you don't expect. Know your opponents as well as possible, you'll find yourself riding with the same guys quite a bit. It can be valuable information if you see a guy breaking loose to know if that is his style, or if he is crashing. Stay awake.

6) *Passing.* Obviously, the straights are the best place to pass but it is quite possible to pass on turns, jumps or wherever you are. The quality of your competition will have a lot to do with where and how you pass. You



Never miss the rider's meeting. Many important instructions are given here, along with any rule changes.

Getting a good start is always important. But if the race is short on a cramped course, it is even more so.



Relax after you get to the start. You'll see some dudes sit and "blip" the throttle for 10 minutes, don't do it.

can nail the donkey almost anywhere on the course, but you may have trouble with the stud.

As important as knowing how and when to pass, is the ability to keep from being passed. Assuming that you are on the same lap as your pursuer, use up as much of the course as you can. Move around on him and reduce his chances of passing you by cutting down his chances. Of course if you are being lapped by a faster rider, you should move over. If not he will probably gently move you over himself.

If you are setting up to pass, you might benefit from harassing the guy some and try pressuring him into a mistake. You may find that he is able to outrun you on the straight, but if you can rattle him by showing him your front wheel out of the corner of his eye, you might make him bobble enough to get by. This is where your gamesmanship comes in. When you do pass, do it forcefully and try to discourage him from re-passing you. If you go by timidly, he will be encouraged to get you back.

7) *Between motos.* Don't do a lot



The first turn can be the most critical on the course. Don't go in so fast that you go down. A bunch of you will lose that way!

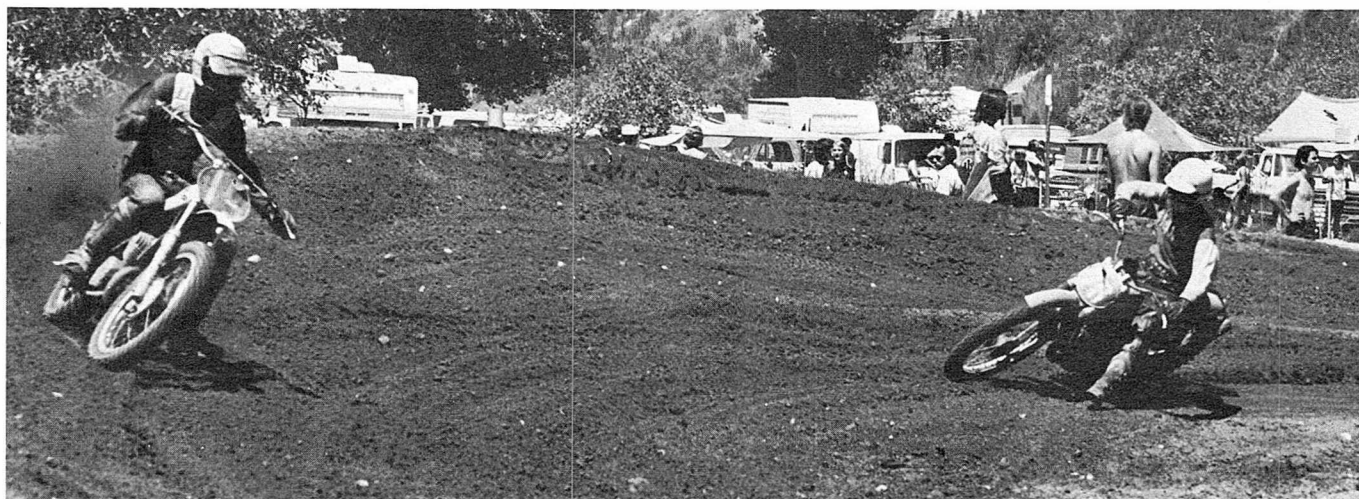
of horsing around between races. Check out the bike and rest as much as possible. Keep an eye on the standings to make sure what spot you're in as this will dictate your strategy in the last moto.

Eat lightly and don't load up on a bunch of junk at the races. Besides being more comfortable, it is safer.

The big thing is to conserve your energy as best you can, because you will need every bit of it for the races.

8) *Ride hard and ride to win.* Obviously there will be some spots on the course where you can and should

Be sure that you have an alternate line for each turn. If someone else has your first choice you can't wait for it. It helps to stay alert to what is going on. Take a look before you cut in and get nailed.



Here one rider has chosen the berm while the other takes the inside line. The berm is always more spectacular, but the inside might be quicker, and the quickest wins.



When you pass, do it with authority. If you just squeeze past, he will be encouraged to get you back. This is assuming that you have a faster bike. Hopefully.

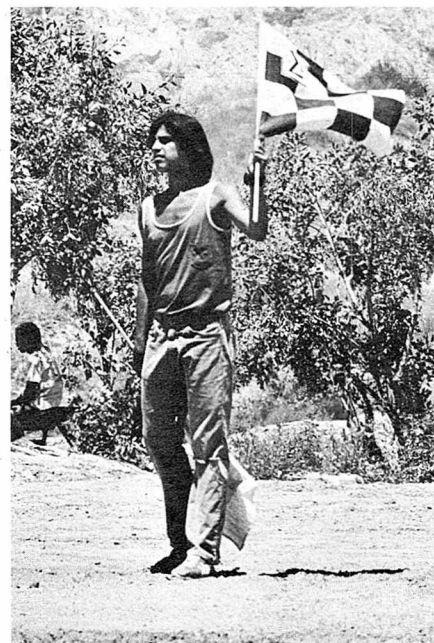
relax. Let the motorcycle do most of the work. This is part of the Europeans' endurance secret, their experience allows them to make a bare minimum of moves on the bike where you see the younger rider wrestling with his ride.

At the same time, you should never let down for a second. One slip or mistake can cost you a place which can cost you some points or a few dollars. Consistency is the name of the game in motocross, it is the guy who finishes well up in *all three* motos who

gets paid best at the end of the day.

Ride aggressively and defensively. Don't go out of your way to look for trouble but be ready if someone comes by with some.

Put all of the preparation, hard work and thought together and you'll not only be successful at motocross, you'll have an awful lot of fun too. There is nothing like winning, but to do it you must be ready and that takes work. But when the man waves that checkered flag over *your* head, you'll find that it was all worth it. ●



Here's what it's all about. When the checkers wave over you, you know all the work was worth it.

PUT SOME MUSCLES ON YOUR MOUNT

Here are some tips on how to make your bike "Six Day Trials" reliable. They're inexpensive and easy too!

There is nothing that can foul up an otherwise pleasant Sunday afternoon off-road motorcycle ride like having to push your bike ten miles through the boonies. From both a safety and pleasure standpoint, reliability is probably *the* key to a fun type day in the dirt.

As you already know, if you've done much off-road riding, your motorcycle takes a fearful beating. Naturally, there are certain parts that catch more grief than others. What can be done about it? How can you make your bike a bit more reliable?

What would be ideal of course, would be a complete "back-up" system. This would be similar to the old Space Agency, "two of everything" scheme. Unfortunately, this costs money, gets complicated, and leaves you with a motorcycle heavy enough to sink nicely into any "off" going that you might encounter.

The alternative, is to "beef-up" your bike with a few tricks that you might see used by some of the I.S.D.T. riders. You know that the I.S.D.T. bike has to be the most reliable thing on two wheels. The beauty of these tricks is that they employ many materials you probably already have lying around somewhere. They are inexpensive, easy to do, and don't take a lot of time. What you get in return for this effort, is more peace of mind the next time you're forty miles from nowhere, knowing

that your bike is more ready for whatever you are going to dish out.

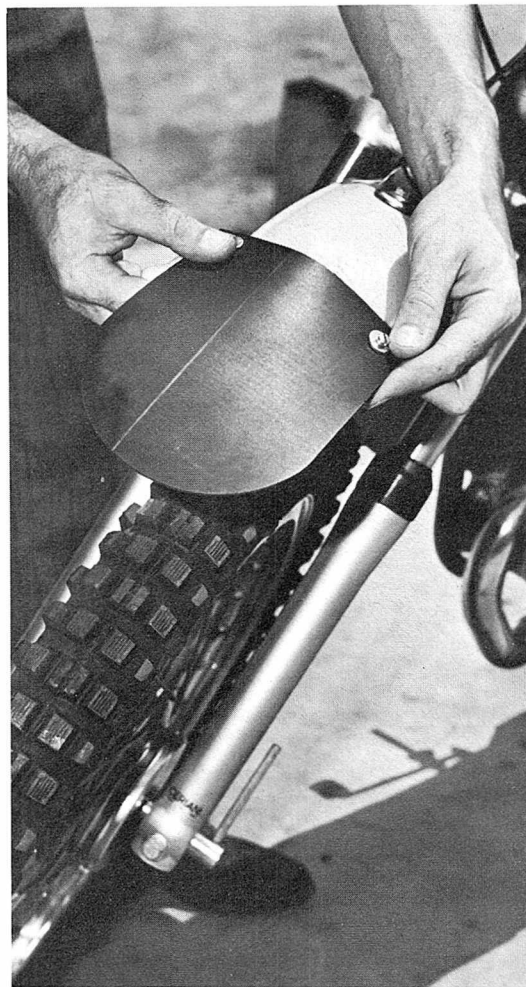
Much of what we'll throw out here is a must for the really serious off-road rider. Even if you are not into off-road riding that heavily, you can benefit from many of the tips. You'll find them easy to perform, and they can make your rides a lot more fun.

Before we take a look at the preparation of the bike, we should mention that reliability depends a lot on maintenance. It is essential for you to keep your motorcycle in top condition, if you expect it to carry you into the back country and take a beating without falling apart.

This means that you should wash your bike thoroughly after every ride so that you can check it over properly. Unless you have extraordinary sight, you can't possibly see broken or worn parts through two months' mud.

Unless you want to put in some time on foot, we would suggest that you replace any parts you feel are wearing, or might soon break. Keep the bike as fresh as possible.

Your between rides maintenance has to include a good "tightening up" session, as things are bound to shake loose. It's a lot easier doing this in your yard, than out in the middle of the desert when it's 105°. Assuming that you keep your bike in top shape, let's take a look at a few things that you can do to help it out through a body building program.



For your own comfort, applying a mud flap to the front of the fender will keep rocks and mud from coming up in your face. A similar flap on the bottom of the fender will keep junk from hitting the engine.

FRONT FENDER

One helpful suggestion as regards the front fender, is to use the "high mount" fender. Of course, many of the bikes manufactured for use in the dirt, come equipped with the high mount. There are some scrambler types that still use the low mount though, and you'll find these to be a pain in the neck when the brush and cactus begin to pile up under the fender.

Another tip concerns both rider comfort and engine safety. Placing a

mud flap on the front of the fender will keep much of the mud and other debris from coming up in your face. Application of a flap at the lower end can help keep dirt and junk from hitting the engine. You will find flaps available at your store, or you might be able to fashion some of your own.

CONTROLS

Trying to say which of the components is most important is impossible because you need all of them, but we'll start with the controls. Without the controls, you go nowhere.

1) Brakes. There are two things especially to watch for on the front brake. Check to see that the brake cable is clear and untangled. There is a tendency for the action of the front forks to cause the cable to become snarled. This can cause the front brake to jam on, throwing you over the handlebars, wondering what the hell happened. Another good idea, is to make sure that the brake adjustments are as tight as possible before you start your ride, they can shake loose.

2) Clutch. Here again, after proper adjustment, be sure and tighten the clutch adjustments so they won't shake loose. Proper clutch adjustment is essential as you'll find out when it feels like your left hand is about to die.

3) Throttle. It is a good idea to tape your throttle cables. The idea here is to keep the outer cable from coming out of the throttle casing. Should this happen, the throttle will stick open, then it becomes, "Grab your thing, you're going for a ride."

4) Grips. You will find that the left grip especially, has a nasty habit of working loose and off. The trick here, is to remove the grip and wrap the handlebar with black friction tape. Next, pour some gasoline in the grip and push it back on. The gasoline and tape will form a bond and help keep the grip in place.

5) Clutch and brake levers. If you do much off-road riding, placing leather covers over the levers will help keep a lot of the junk that you pick up from piling up in them and making them difficult, if not impossible to use. These covers can be bought at many motorcycle shops.

ENGINE

There are a couple of tricks you can use on the engine to assist reliability. Basically, they are aimed at two of the demons of the off-road, water and dirt.

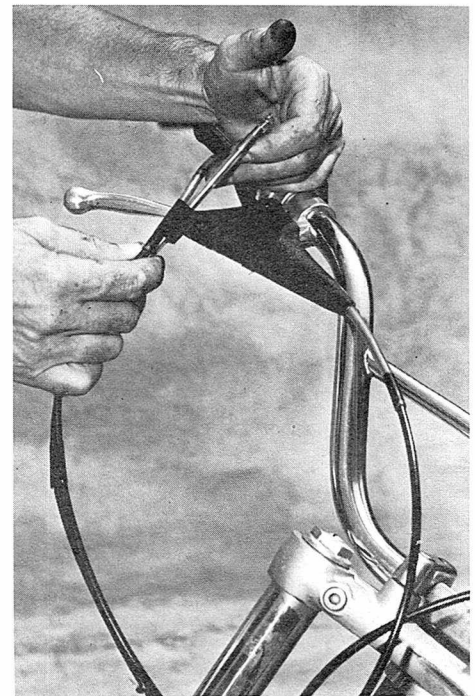
1) Waterproof cables. You will be able to find some commercial "anti-moisture" compounds in your bike shop. Spray the cables with the mixture, where they enter the case. This



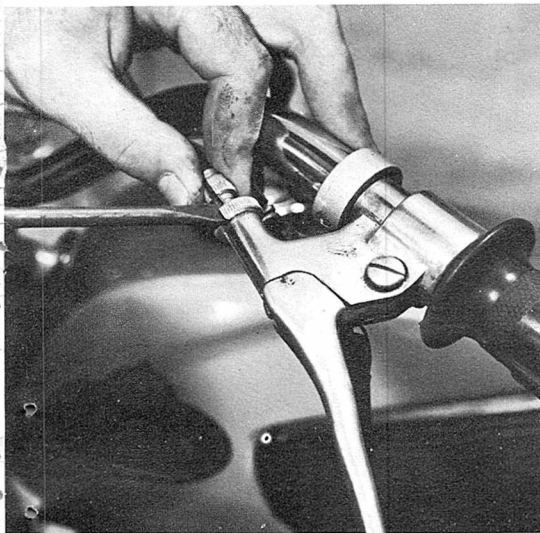
Make sure that your brake cable is straight. Sometimes the front fork action causes the cable to bind and can jam the brakes on suddenly.



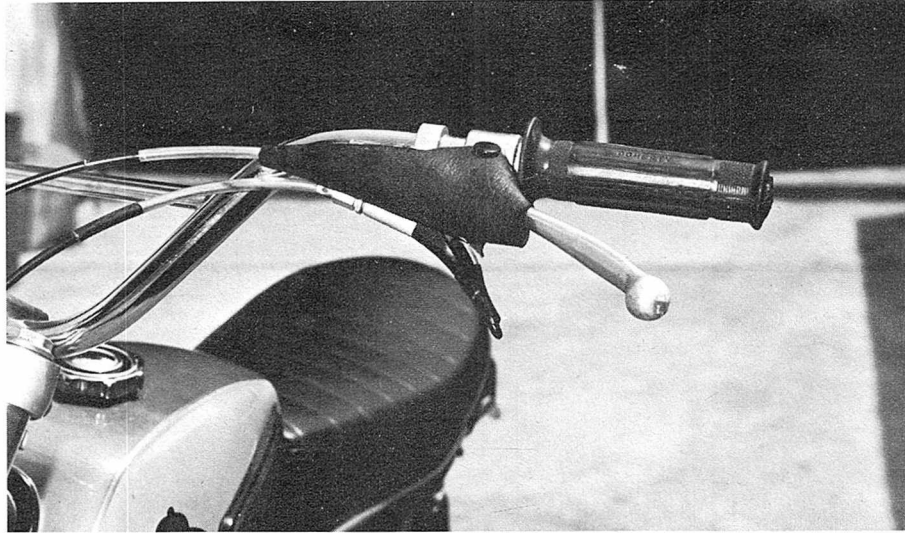
Taping the throttle cable can keep the outer cable from coming out of the throttle casing. If it should, the throttle will stick open which is dangerous.



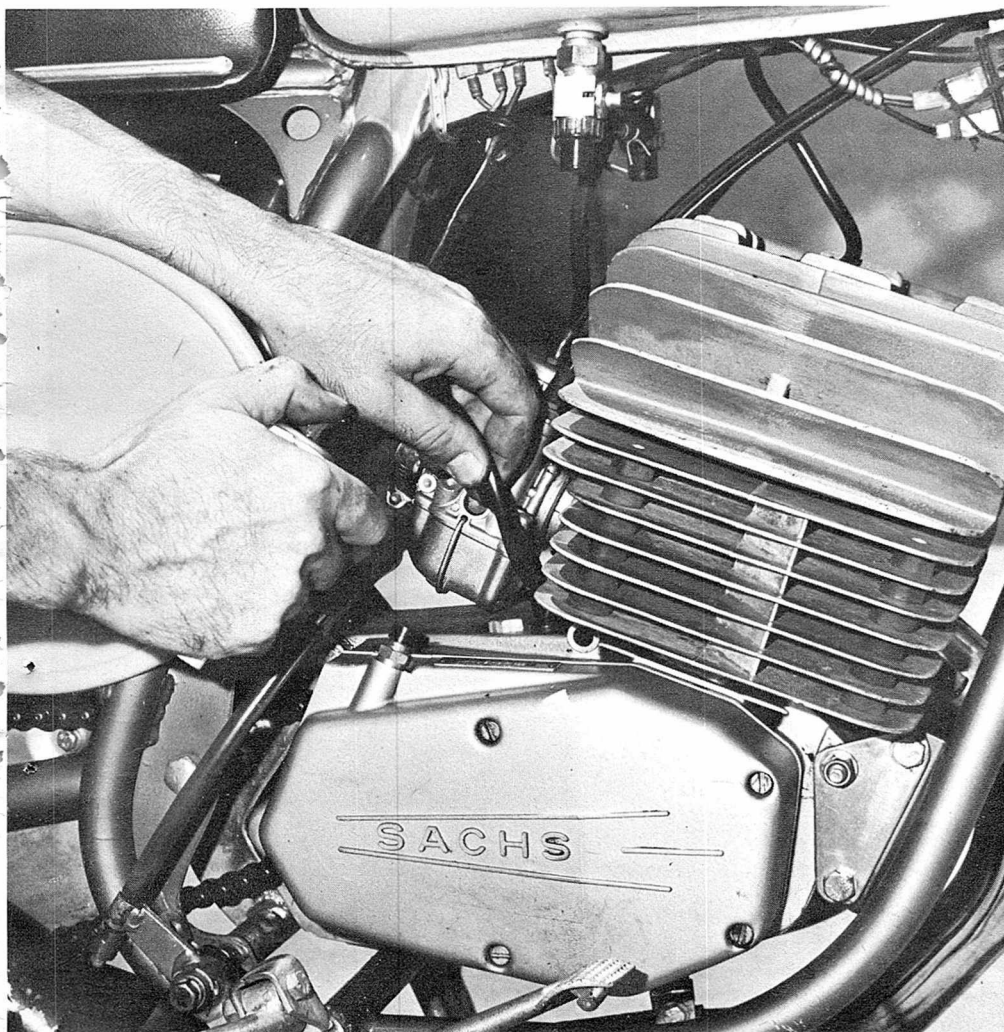
Tape a spare cable to the existing one and you're set in case of a break. If you decide to carry just one spare cable, make it a throttle cable.



Make sure that the adjusting nuts are well tightened. Do this with both the throttle and brakes because they will work loose as the bike is jostled on your ride.



These commercial leather covers will help keep junk from piling up in the levers. They become hard to use when the brush fills them up.



Spraying a waterproofing compound on the cables will help keep moisture from going down the cable holes to the magneto.

will help keep water or moisture from getting down the cable holes to the magneto and generator. You'll understand the principle when you stall in the middle of a stream somewhere. It's a bummer.

2) Sealing H.T. cable. It is wise to seal the H.T. cable to the coil. Here again, the idea is to keep the moisture out. In addition, this cable has a habit of working loose, so the seal helps there too. There are commercial sealants available at the bike shops.

3) Air cleaner. Here's a neat trick to help out your air cleaner. Coat the walls of the air cleaner box with grease. The grease will attract some of the dirt that would otherwise go right into the air cleaner. This will take some of the burden from an important part of your dirt machine.

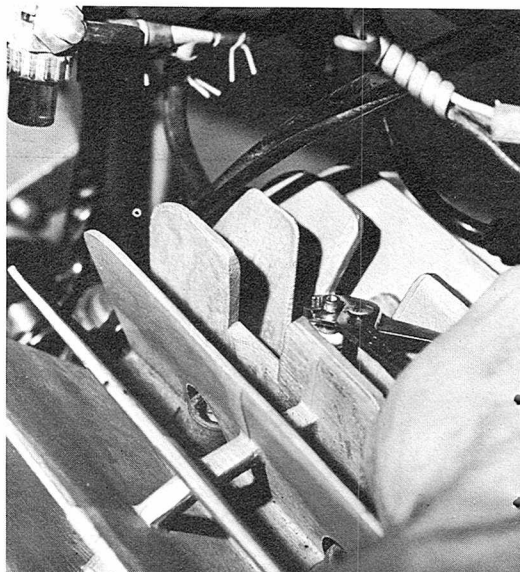
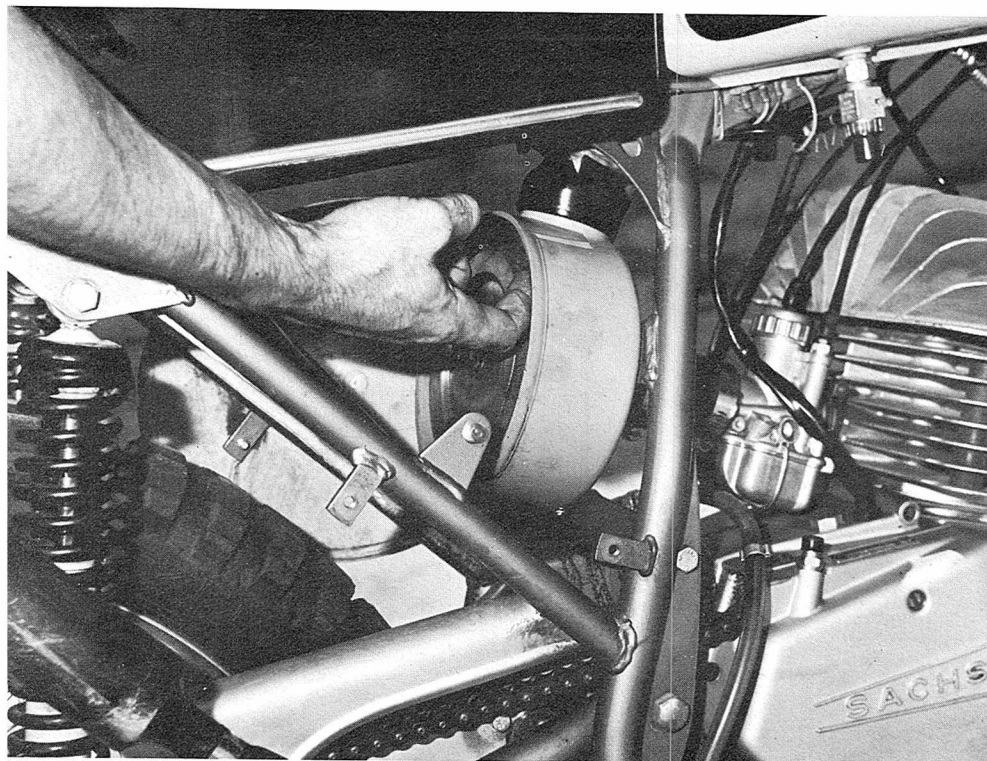
4) Spark plug. A good move would be to tighten the brass top on the spark plug before you go roaring off. This ring has a tendency to work loose. If the ring should come off in the plug cap, as it will, in time, you will find yourself in a world of hurt.

SKID PLATE

An essential accessory, if you ride much off-road, is the skid plate. You'll find that this heavy metal plate serves a triple purpose. At once, the skid plate protects your exhaust system, frame and engine. You will be hitting rocks, ruts, logs and who knows what, and the bottom of the bike suffers greatly. The skid plate can ease some of the suffering and help keep your bike in one piece. It is a wise investment.

FOOT PEGS

Again, if your motorcycle is designed primarily for the dirt, you will probably find that it is already equipped with the serrated foot pegs. If however, your bike has the round foot pegs, we would strongly recom-



You might tighten the brass ring on the top of the spark plug. This has a tendency to loosen and may come off in the plug cap. It is almost impossible to remove in the middle of nowhere.

Applying grease to the walls of the air cleaner box will help keep the filter clean. The grease will attract and collect some of the dirt that the filter would otherwise collect.

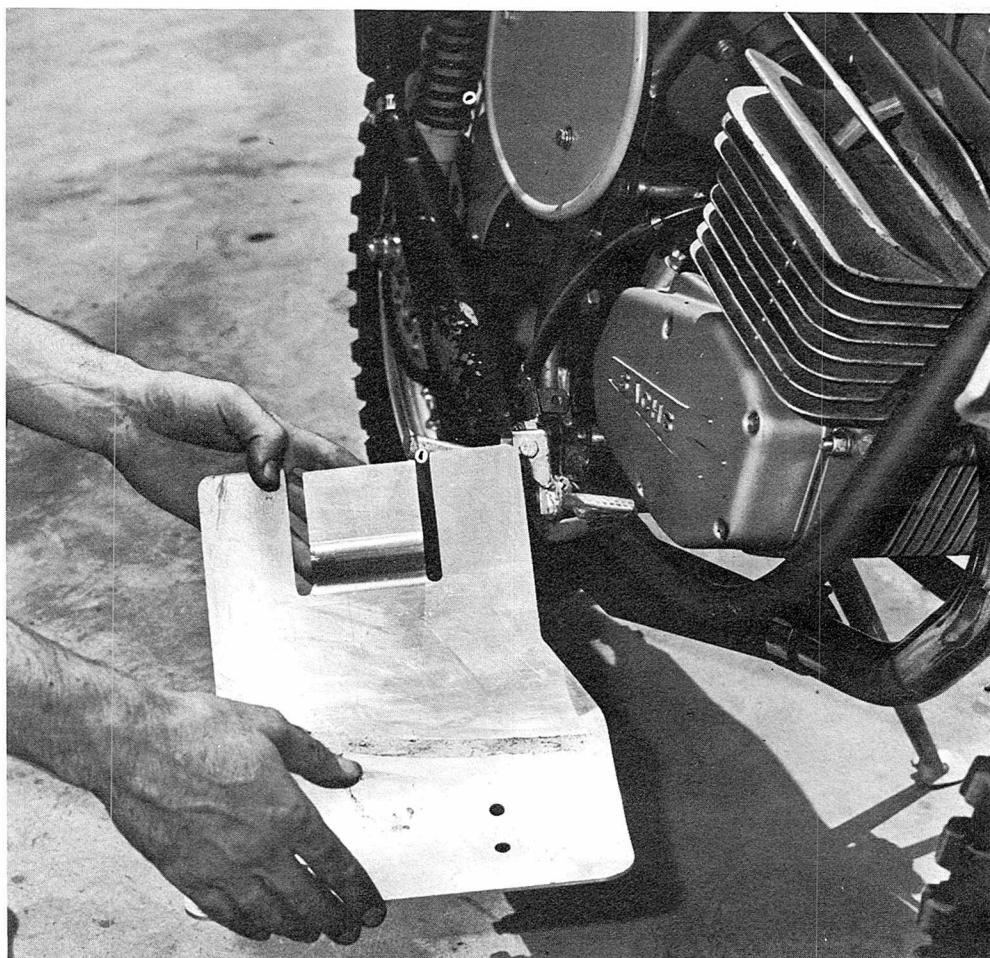
mend your changing over. The serrated peg features a rough edge to help keep you from slipping off, especially when it becomes wet. It is usually hollow to prevent dirt from piling up on it, and the flat surface is more comfortable than the round when you are standing on them. You may find that much of your time on the off-road is spent standing on the pegs, so give yourself a break and get the ones designed for that purpose.

TIRES AND SPOKES

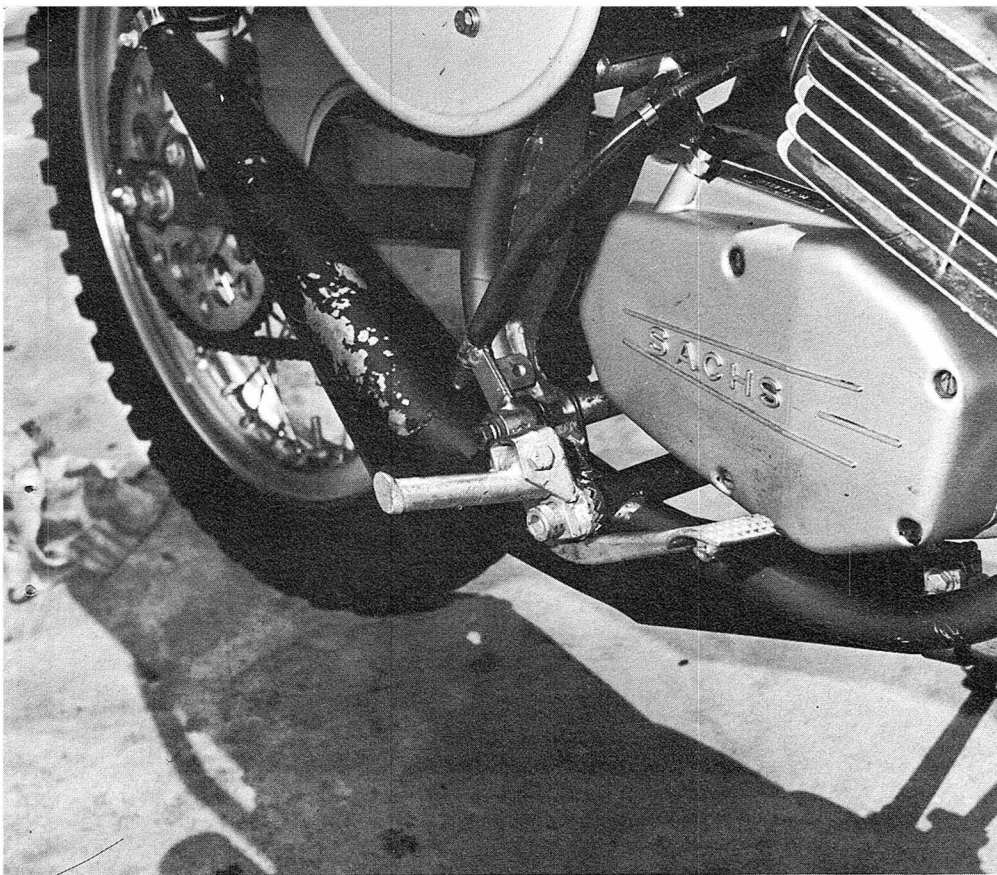
In addition to your obvious maintenance of wheels, spokes and tires, tire condition, air pressure, spokes tightened, here are a couple of useful tricks on the wheels.

1) Wiring the spokes. Wrapping some thin wire around the spokes everywhere they cross can be most helpful. Spokes bear a considerable burden and have been known to break. When spokes break, they can do some pretty freakish things to the tires and tubes. Wiring the spokes won't keep them from breaking, but it will keep them from wandering around and doing any other damage. Simply wrap the wire around a few times, crimp the ends and trim the excess.

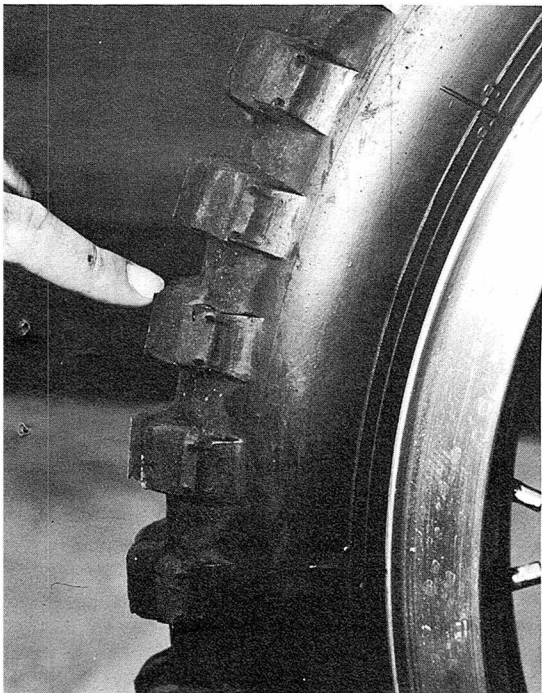
2) "Rotating" the tire. You can get double the wear from your rear tire



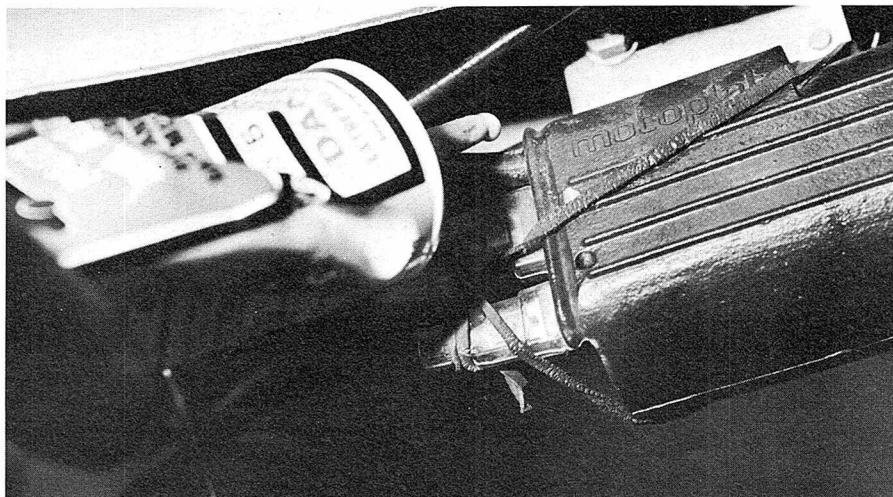
A skidplate is a must if you are going to do a lot of off-road riding. The skid plate protects your exhaust system, frame and engine all at once.



This bike has been equipped with round foot pegs. We would suggest your making sure that you have the serrated foot peg. It gives you a non-skid surface and you'll find that you spend considerable time on the pegs on the off-road.



The leading edge of the "knobbies" will gradually wear down. By turning the wheel over on the rim you can double the life of your rear tire by taking advantage of the second edge.

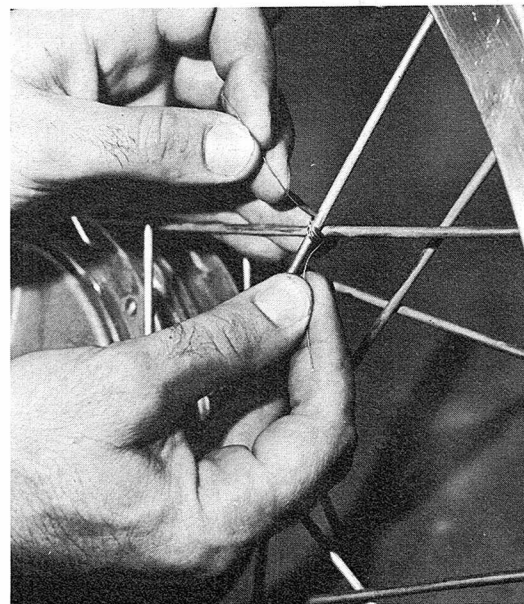


It helps to seal the H.T. cable into the coil. This cable has a habit of working loose and the sealant will also prevent moisture from getting into the coil.

by turning it over on the rim after a time. In this way you can get the use of the other side of the "knobbies," once the leading edge has worn down some. This trick will help prolong your tire wear.

REAR SHOCKS

A useful hint for the rear shocks is to tape the collets to the shocks. As you can well imagine, the rear shocks take as much, if not more of a beating, than anything on the bike. After being smashed around for a while, the collets can come loose and drop out. Tap-



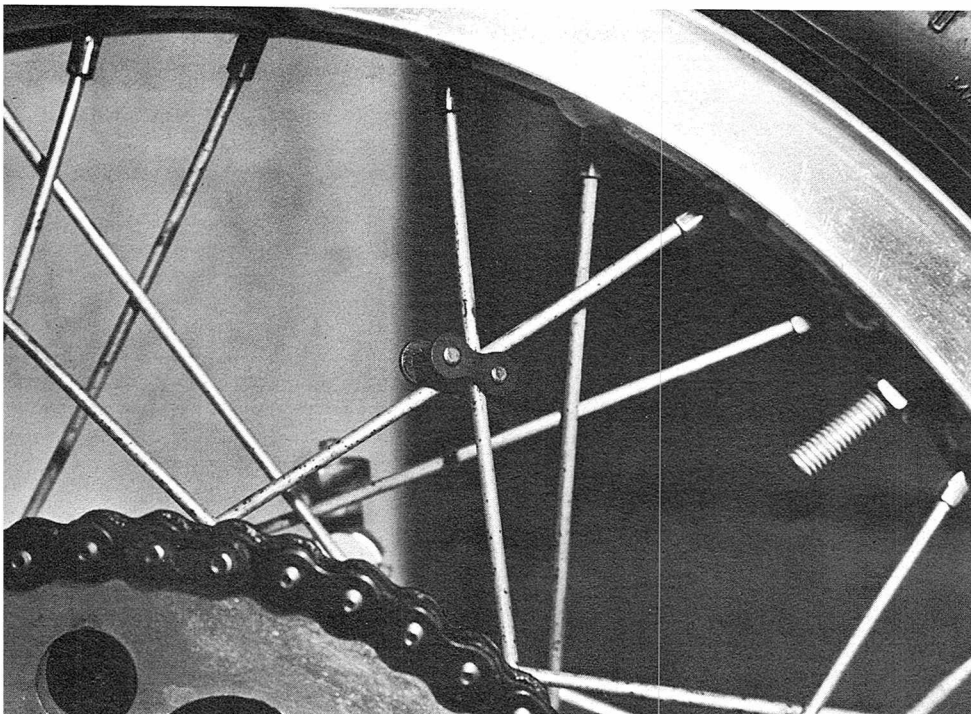
Winding some wire around the spokes where they cross will help keep them from doing any more damage if they should break. After you crimp the wire, be sure to cut off the excess.

ing them to the shocks will help keep the unit together, and a most important unit this is!

SPARE PARTS

Going back to the "two of everything" idea, you can see where it would be quite easy to go off the deep end on taking spare parts along. A lot depends too on just where you are going. If you are just going around a bike park, chances are that you won't carry anything extra with you (aside from a plug maybe). If you are going for a hundred miles or so across the desert, that's something else. In that case, we would suggest you take some spares along.

1) Split link. If the chain should break, you'll be in dire need of a split link. A spare split link can be attached



to one of the rear spokes quite easily. By the way, the correct placement of the split link is so that the open end is opposite of the direction of travel.

2) Spare cables. It is quite easy to carry a spare cable along. Just tape it to the existing cable. You can carry a spare for each cable if you like, but if you decide to carry just one, you'll find that you can probably most use an extra throttle cable.

TOOL KIT

Somewhere between your "PROTO" rollaway, and a screwdriver; there is an ideal off-road tool kit. Again, a lot depends on where you are going and how long you'll be gone. Your tool kit should include at least a spare spark plug, plug wrench, screwdriver, some spanners, tape, wire, and pliers. You may want to have some tire patching tools along, but this depends on how far you'll be straying.

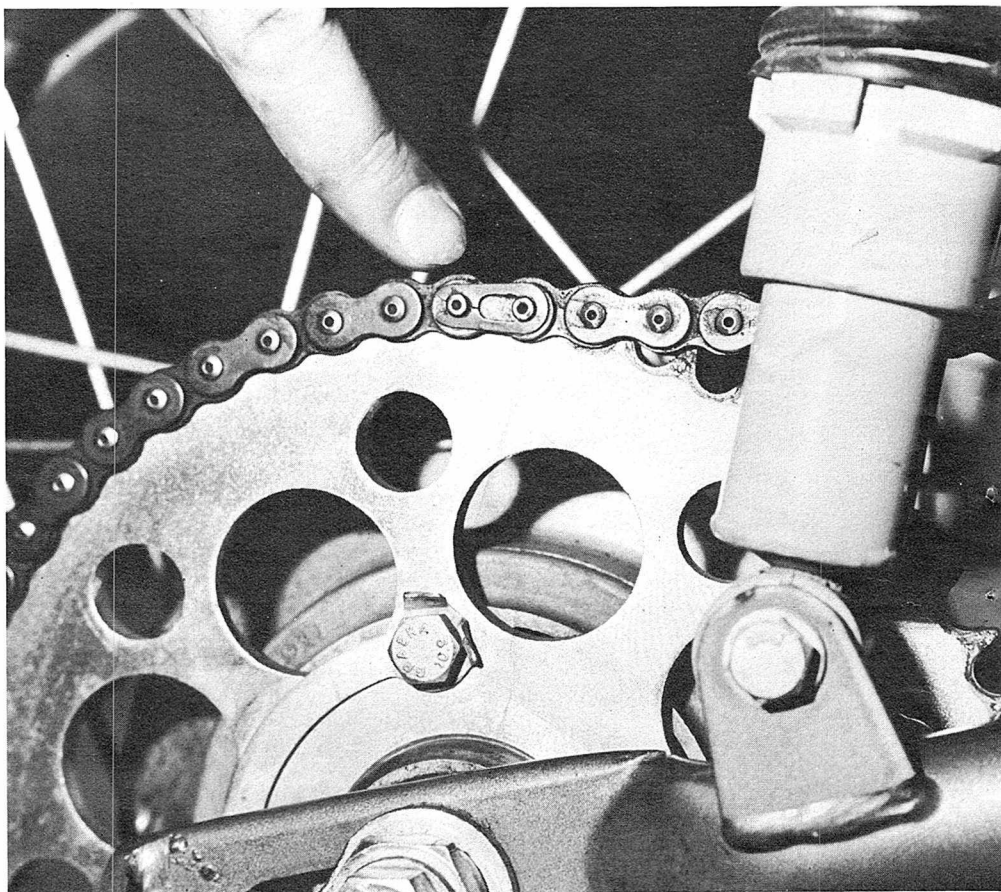
Here you can do your own thing, but it is strongly recommended that you take *something* along. Otherwise, you'll find that it's a long walk from the middle of nowhere, and they may find you muttering something about, "My kingdom for a screwdriver," when they come to pick you up.

So give your motorcycle a break, give it some help in carting that big "bod" of yours around in the boonies. Besides helping your bike last longer, you'll find that having done some of these tricks will make you feel a whole lot more comfortable and confident the next time you're doing your favorite thing in the whole world, cow-trailing. ●

It is quite easy to attach a spare split link to one of the rear spokes. You will be able to use one of these if the chain should break.



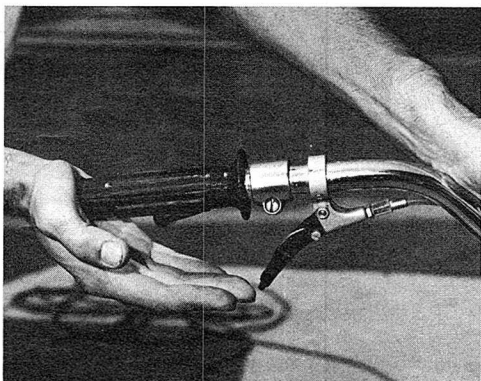
Taping the collets to the rear shocks will help keep them on the bike. This is a heavy stress point on the bike and the collets can drop out after they take a beating for a while.



This is the proper position for the split link. Notice that the open end is opposite of the direction of travel.



This high mount front fender is a must for off-road riding. Most bikes manufactured for dirt use will be equipped with this fender, if yours is not, we would recommend it.



The left hand grip has a habit of coming loose. Remove the grip and wrap the handlebar with friction tape. Pour some gasoline in the grip and push it back on. The gas and tape will form a bond to keep the grip tight.



This tool kit is handy to have along. You should at least carry a spare plug, and wrench, some spanners, a pliers, screwdriver, some wire and tape.



HERE COME THE

DAREDEVIL SIDEHACKS

If maneuvering one of those sidehacks looks difficult and exciting, it's only because it is.

The next time you happen to get stuck in a horrendous line at a concession stand at the races, just yell, "Hey, the hacks are up next," and go right to the front of the line. Nothing will get spectators to the edge of

the course quicker than the knowledge that the hacks are about to run.

Sidehack racing is probably the most spectacular event in racing, but despite its spectator appeal, they have trouble finding places to run.

There is a sidehack association in Southern California with perhaps 100 members. The group is expanding all the time even to an international level. Despite their keen competitiveness between the green and checkered flags, the hack group is really quite close. It's not at all uncommon to see

a healthy hack go out to tow in a busted one, even though they had been fighting "tooth and nail" just a few minutes before.

There are three basic types of sidehack; the street bike, the dirt or desert hack, and the road racing hack. At one time there wasn't a lot of difference between the dirt and road racing hacks, a change of tires and gearing and the guy would switch back and forth. But in the past couple of years, the road racing machines have become more exotic and can run



Hanging it out at Hopetown. It looks like the rider on #35 almost has a tiller in his hand.

"Grab your thing, you're going for a ride." As you can see here, it is possible to make a hack from a smaller bike.

anywhere from \$2000 to \$3000. They are also capable of running up to 140 mph! By contrast, you can build a pretty competitive dirt hack for around \$1000.

There doesn't appear to be any one bike that seems suited for sidehack work. There was a feeling for a while that you needed some monster bike for a sidehack, but with the advent of space age "lightweight" materials you can build a neat hack with a Greeves or Bultaco if you want. The Honda Four is being used more all the time for use in the road racing bikes.

The most basic differences in the dirt and road hacks are, as you would imagine, in the tires, gearing and suspension. The basic power plant is the same. The road racer doesn't need the same amount of torque as the dirt bike, and the dirt bike doesn't need the top end speed of the road racer.

As far as handling is concerned, the road hack handles much the same as



a sports car would. The riding and driving techniques are the same for the road and the dirt with the exception of course, that because of the increased speed, you have to react a bit faster on the road.

There is quite an adjustment necessary if you are to go from riding a solo bike to one with a side hack. There is a theory that someone who

has never been on a bike can adapt to a hack more quickly than an experienced solo rider. The most basic difference is that you don't lean a side hack, you steer it more like a car.

What is most important for a racer is to develop a good team. Each man has equal responsibility. A rider can't just hop on for a new driver, or a driver grab anyone out of the pits to



On right handers, they want the weight on the "board." Here the important rider provides that weight.

The hack group fights hard between the flags, but when it's all over, they're the first to help. It's tough sledding uphill.

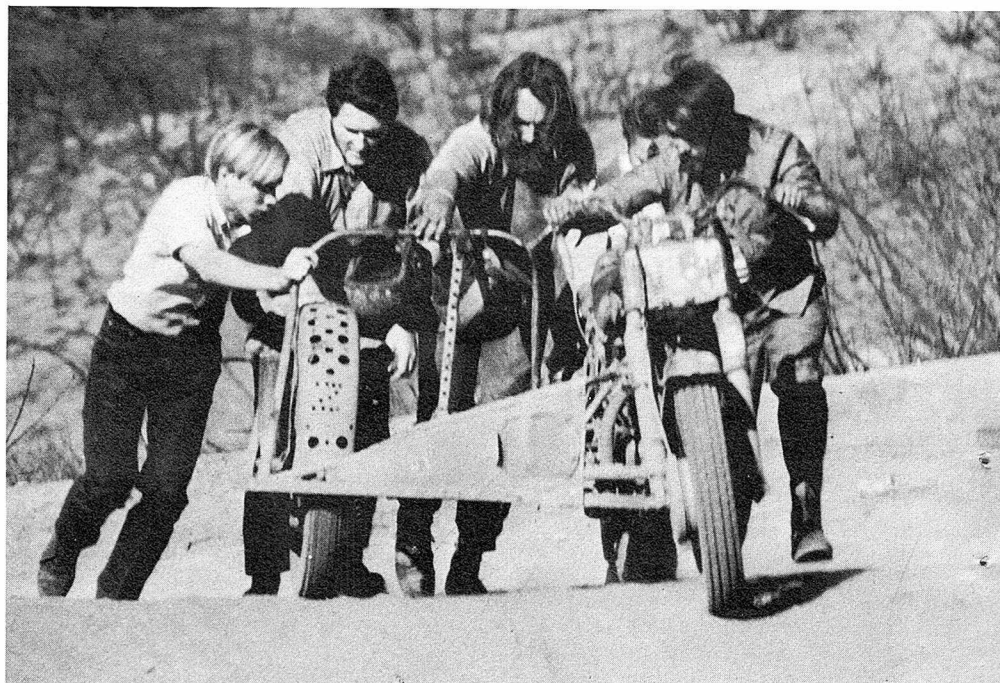
ride for him. They must work together and have logged many miles together. Even then, the team is always "changing their act," and improving. It is a constant learning process.

The rider, or the guy "on the board," is critical for maintaining the balance on the machine. On a right hand turn, you'll see the rider leaning 'way out to the right. On a road course at 100 mph plus, this takes guts, and as you can see, the idea is to get as much weight on the hack as possible.

On a left turn, you'll see the rider crossing behind the driver to shift the weight to the left, away from the hack. The only real trouble that they sometimes get into on a left turn, is that the rear wheel may have a tendency to lift.

On the straight, you'll see the rider tuck in behind the driver. In addition to reducing the wind resistance, it adds traction to the bike and gives them better drive.

So you can readily see that on a twisting course, the rider will be all



over the bike, and he better be in the right place at the right time or the team is in trouble.

The Europeans have done a certain amount of motocross on hacks and specialized the equipment for it. Here in the U.S. the same bike is used for desert scrambles, and on the motocross type course. This makes it even a bit more hairy for the team. But then

again, this is what has people stacked 20 deep around the water hole at the annual Hopetown event in southern California.

So the next time you want some room to yourself at the races, just casually drop the hint that the hacks are about to run, whether they are or not, and then stand back because the fans love them. ●



Ernie (Santa Claus) Aragon at the annual Hometown bash. As you can see, the sidehacks folks have fun.



With the Hometown "off-camber" negotiated, the rider is shifting over to set up the next turn, a left. If the rider doesn't get there in time, the team's in trouble.

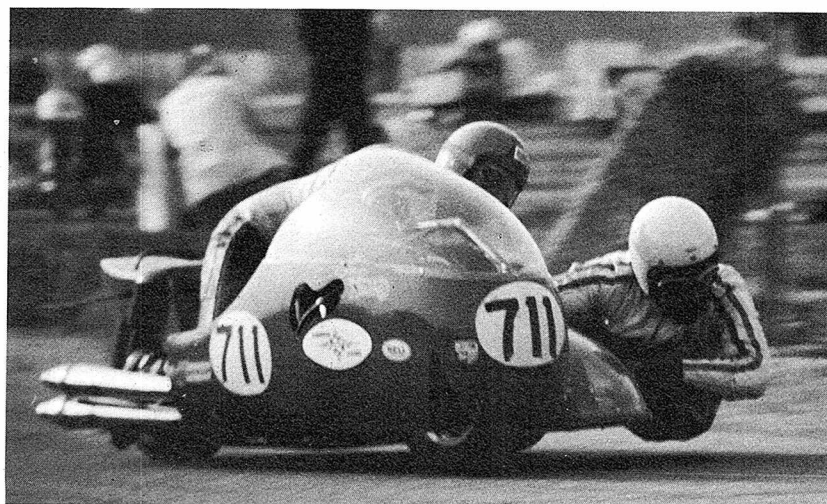


This is really "letting it all hang out." Don't think this doesn't take guts at 90 mph plus!

The road hacks can run to as much as \$6000. Bikes such as this are capable of speeds up to 140 mph!



Don't let the "staged" appearance fool you. These guys are going almost 100 mph at this point.



BUYING A USED DIRT BIKE



You don't always have to fear buying a used dirt bike if you use your head. Here are some tips on what to watch for.

To borrow from William Shakespeare for a minute, hundreds of dirt bike enthusiasts are faced with the same dilemma each day: "To buy, or not to buy? That is the question". It is a very good question, and the answer is as varied as the number and types of bikes there are for sale.

One consideration is, "How much riding am I going to be doing, am I really serious about this"? Another thing to consider is your experience. Since motorcycles are *relatively* inexpensive to begin with, it might pay you to buy a new bike if you are really serious about riding. The advantage of owning a new machine is obvious.

But there are also many reasons why you might want to look into buying a used bike, not the least of which is money.

The natural tendency is to think of buying a used vehicle as inheriting someone else's headaches. This can be very true. But you can also come across some very fine deals in the way of used bikes, if you keep your eyes open for them. Many times someone will buy a new bike, then find that he has lost interest. Sometimes it is the little lady who puts the pressure on. And often, someone just plain needs some money in a hurry. So let's take a look at some of the things you should watch for in buying a used motorcycle.

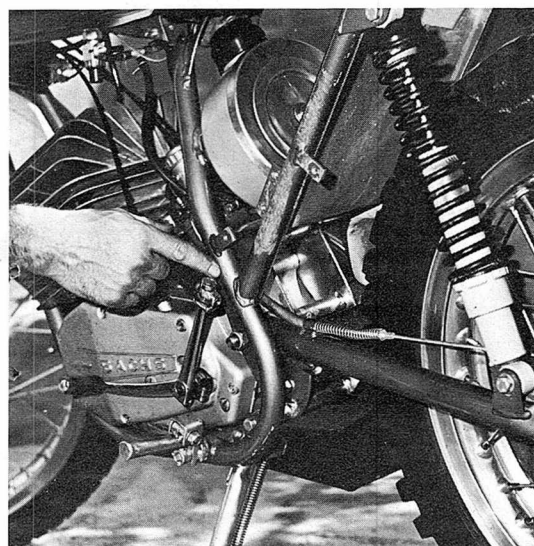
First off, beware of *too* fabulous a deal. You don't want a bike that you have to ride with asbestos gloves, or that the police will soon be taking back.

Take your time when looking over a used motorcycle. Don't rush into the deal, you may be sorry later. If you are not really that sharp on the mechanical aspects of motorcycles, take a knowledgeable friend along, or take it to a good mechanic. If the motorcycle is in good shape, the person selling it should have no objection to your

Check the condition of the front forks by depressing them. See what kind of shape the cables and levers are in.



A good place to start is getting back and checking the frame for alignment. If the frame is "tweaked", shine it on.



Look at the welds to make sure they are secure. Check the frame for cracks or dents. Never try to appraise a mud caked machine.



Check the front wheel and tire. Look for weather "checking" on the walls of the tires. Make sure the wheel is not bent and that the spokes are present and tight.



With the front of the bike suspended, check the race. Look for wobble in the front end.



Check the overall "cosmetic" appearance of the bike. Watch out for the "spray can overhaul". You can be fooled by a sparkling exterior.

having someone check it over. If the seller is reluctant, you would be well off to look elsewhere.

Also, make sure that the motorcycle will fit your needs. Don't buy a bike that you can't even begin to handle. If you are going out "cow-trailing" you won't really need a racing bike, or some "monster" handful.

Let's assume that you have decided to look at a good deal in a dirt bike, and you're sure it's for you. What can you look for to make reasonably sure that you're getting a good deal?

First off, a used dirt bike is bound to be somewhat scarred, unless it is almost brand new. Don't run from it because the paint is scraped in a couple of places. But there are some things to look for that will give you some clue to how the bike has been treated and the condition it is in.

You might start from the front and go right on back. Start by checking to see that the frame is not "tweaked". This means standing away some to see that everything lines up well, if it doesn't, forget it.

Next, you might check the front wheel and tire. Look for "checking" on the sidewalls of the tires. Check the rim to make sure that it is not bent or nicked. Check to see that the spokes are all there and that they are tight.

Check the front suspension by working the fork tubes, are they shot? You can also check the race by elevating the front of the bike and looking for looseness here.

At this point it would be good to check the welds on the frame. And be sure to check the frame for any

cracks. It goes without saying that you should never try to check a mud caked motorcycle, but it is unlikely that anyone would be selling it in that condition anyway.

Take a look at the engine. Look for signs of oil leaks, or any crack in the case. A look at the spark plug can give some insight as to the bike's condition. Remove the air cleaner and check its condition. Again this will yield clues to its care. Finally, drain a bit of oil from the crankcase and check it for cleanliness. Be sure that there are no foreign objects in the oil. Bits of metal can mean trouble.

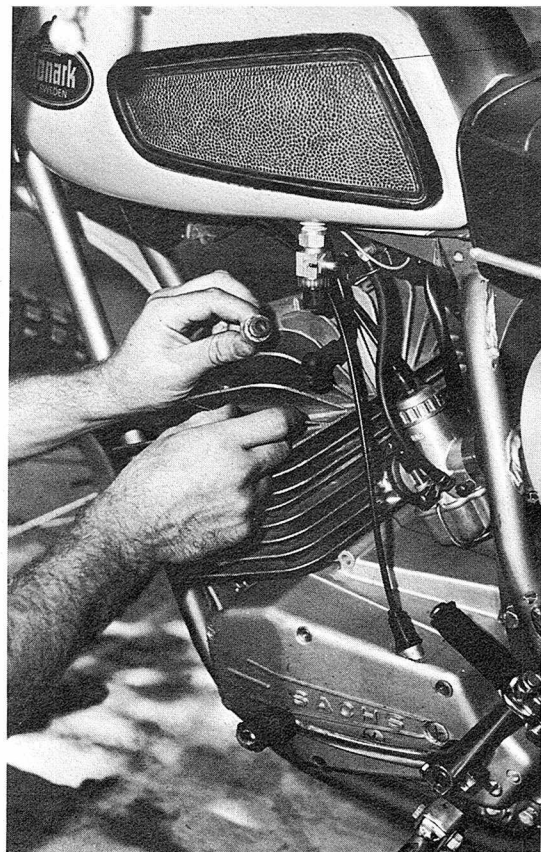
Take a look at the exhaust system. Check the pipe for cracks and to make sure that the welds are good here.

Moving to the back, take a look at the rear suspension. Check the condition of the chain and the rear sprocket. This can tell you a lot about the wear the bike has seen. Check your back wheel, tire and spokes.

Then check the overall appearance of the bike, such things as the gas tank, paint, cables and upholstery. Beware of the "spray can tune-up", you can make a motorcycle look like a million dollars with just a couple of cans when in fact, it is falling apart underneath the new paint.

Naturally, you'll want to fire the bike up and ride it. Here is where your expert help can be especially useful. Many bikes will sound like heck to the untrained ear. Each bike has its own distinctive noise, and many of them are quite harmless. If you don't know, get someone to listen to it for you. You might blow a good deal over a normal noise.

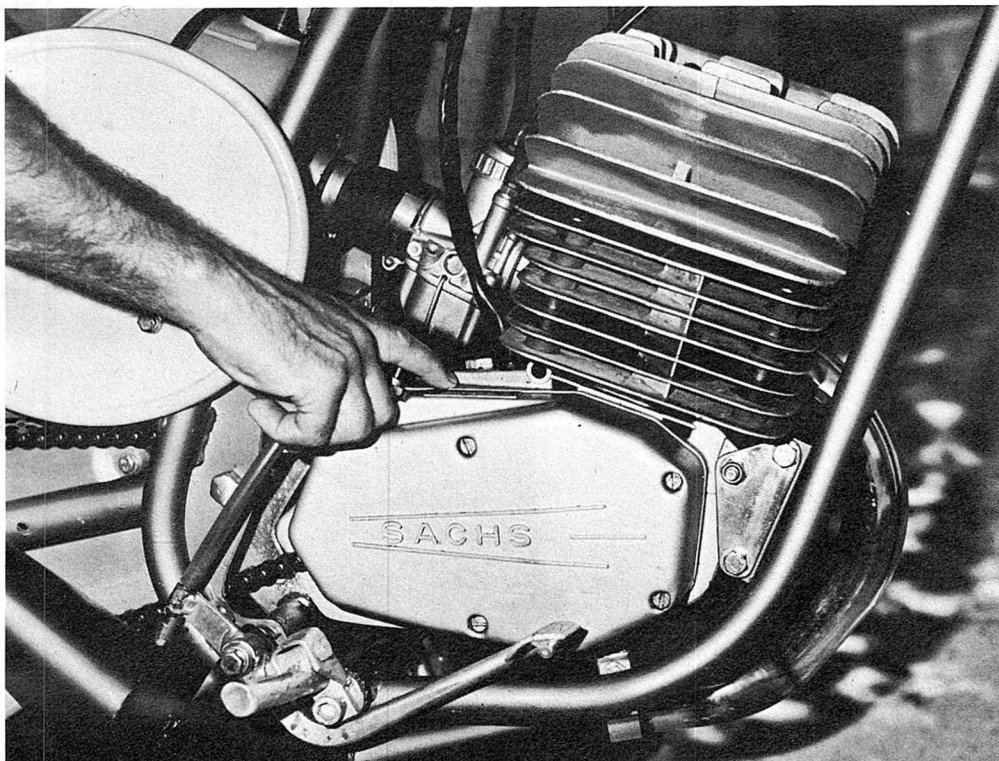
Then if the bike passes inspection, buy it and have a ball. If you just remember to take your time and be intelligently critical, you can sometimes "steal" a darn good dirt bike.



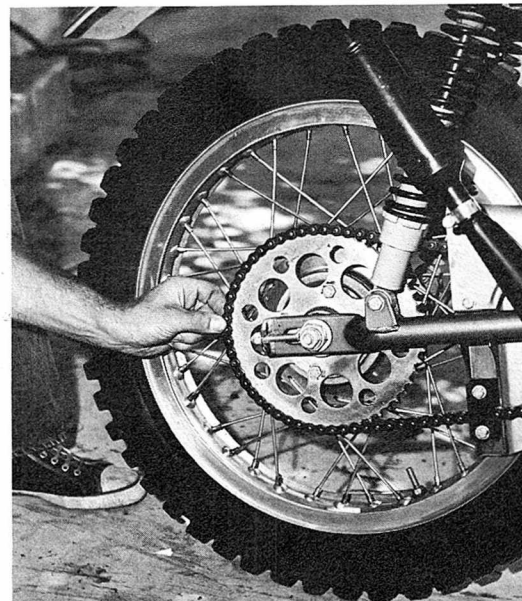
Remove the spark plug. Much can be seen here regarding the condition of the machine.



Be sure and check out the rear suspension. Make sure that there is no excessive looseness or wobble.



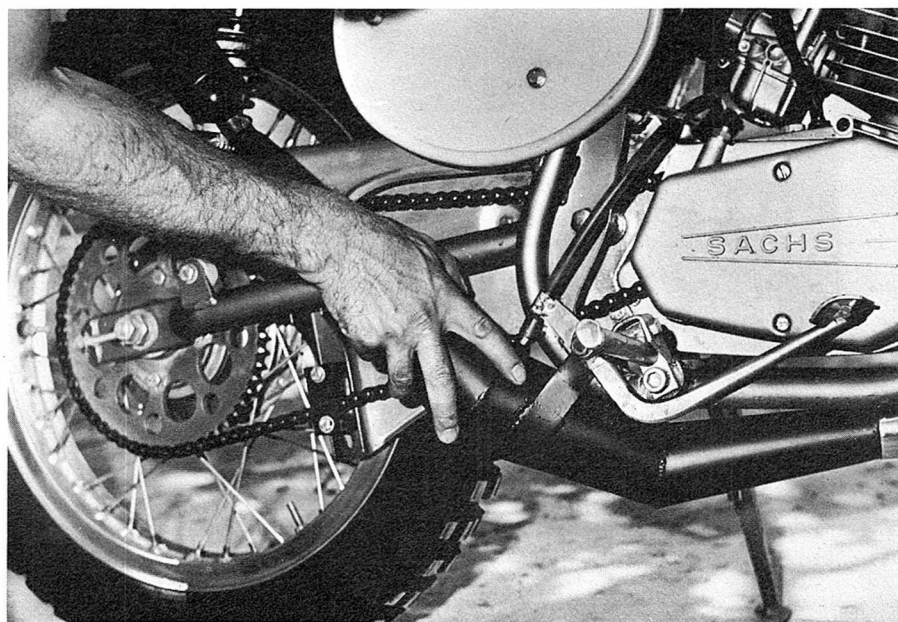
Take a look at the case and engine exterior for any signs of cracks or oil leaks. Battery condition gives a clue to the care the bike has received.



The condition of the chain and rear sprocket can tell a lot about what the bike has been through. Check the rear wheel the same as you did the front.



Remove the air cleaner. An excessively dirty filter could mean that the bike has not received the best of care.



Take a look at the exhaust system. Check it for cracks or leaks and make sure that the welds are tight.



Remove some oil from the crankcase and check its condition. Particles of metal in the oil can spell trouble.

WHAT MAKES A DIRT BIKE HANDLE?

Some factors are clear cut, while others are covered in mystery and disagreement. Here's a closer look at the factors of motorcycle handling and how they apply to you.



What makes a dirt bike "handle?" On the surface this might seem to be a pretty simple question to answer. It might seem simple, that is, until you begin listing the various factors that may affect motorcycle handling.

Once you get through factors like the front and rear spring rate, front and rear damping rate, overall weight, balance, fork angle and length of the rear swing arm, you begin to have a feeling for the problem. When you then add to this, some of the slightly less obvious factors, like: the relationship between the front fork angle and the overall wheel base, the general configuration and rigidity of the frame, mounting location of the rear shock, pivot point for the rear swing arm, power characteristics of the engine, location of the foot pegs, size and weight of the rider, and other numerous points, the problem becomes even more challenging. When all of this, however, is compounded by the fact that there are a great

number of interrelated, interdependent factors, and the question: "What makes a dirt bike handle?", begins to take on rather ominous proportions.

Before, in fact, we can really talk much about motorcycle handling, we have to have some specific frame of reference. What is it that we want our motorcycle to do? What are our goals when we say that we want better handling from a dirt bike?

When you jump on a dirt bike, the idea is usually to get from one point in the boondocks to some other point, over terrain that may vary from fast winding fire roads to rocky woodlands and from narrow mountain trails to soft sandy riverbeds. General requirements usually include straight-line stability, as well as the ability to change direction with some degree of accuracy. Another important factor of handling is being able to maintain a certain amount of contact with the ground. These requirements seem to

Often the factors that are responsible for one bike being faster than another are more related to the rider than any physical characteristics.

be simple enough, but achieving them is not always easy.

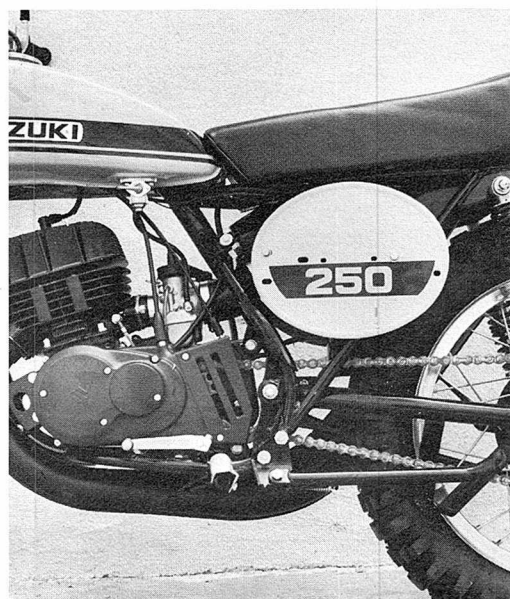
Part of the problem is the fact that many of the desirable factors of handling are not entirely compatible, with one another. Perhaps the most obvious of these is being able to have a high degree of stability while traveling in a straight line, and still being able to turn precisely at slow speeds.

Keeping the wheels on the ground is also one of the key problems, since no other factor of handling really means much without this contact with the ground. Here again, however, the problem is complicated by many different requirements for the different conditions that may be encountered.

What the whole problem boils down to is the fact that any motorcycle con-



Steering head rake is measured as the angle between the axis of the steering head and a vertical line perpendicular to the ground.



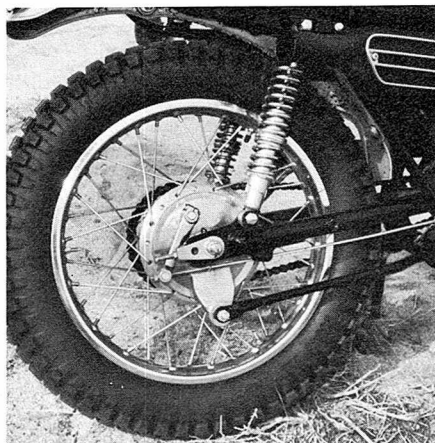
Both the swing arm pivot point and the length of the arm can have an effect on handling, although different riders don't always agree on what that effect is.

figuration is by necessity some form of compromise. Resolving this dilemma means, first, being able to determine what qualities are most important to each individual's riding requirements. Even after a particular set of handling requirements have been determined, however, there may be no hard and fast rules for achieving them.

One factor which has an important effect on motorcycle handling is the

wheelbase. The wheelbase is measured from the center of the front axle to the center of the rear axle. This measure represents the distance between the only two points of contact that the motorcycle has with the ground, the small patches of tire tread on the front and rear tires. The wheelbase itself, without regard to other factors, which we will bring into play later, has its primary effect on the tendency of the bike to hold a stable, straight course and its ability to change direction.

Generally speaking, the longer the wheelbase, the more stable the machine will be when following a straight path. This fact is readily illustrated by the many extremely long wheelbase streamlined machines that annually make assaults on the world speed record at the Bonneville Salt Flats. On



Most riders will agree on the benefits of a floating rear brake, but few can come to an agreement with regard to desirable spring rates and damping qualities.

the other side of the coin, however, is the effect that a long wheelbase has on the ability of the bike to change directions.

Some of the very same factors that improve the straight line stability of a bike with a longer wheelbase, greatly limit its ability to maneuver and turn. This shouldn't be too surprising, since it is only natural that if something is helping you to go straight it must, at the same time, be preventing you from not going straight.

In addition to this tendency for the longer wheelbase to want to go straight, a tendency which becomes stronger as speed increases, is the fact that the longer wheelbase is at a physical disadvantage when it comes to turning in a short distance at slow speeds.

So, before we even get beyond the

simple measurement of the distance between the front and rear wheels, we are faced with the first compromise. How much low speed maneuverability are we going to be willing to give up for the sake of straight-line stability at higher speeds. Although the wheelbase itself is a relatively simple measurement, the factors that combine in order to establish that particular wheelbase are a bit more complex.

The three factors which combine to give a particular machine some specific wheelbase, include: The size and shape of the frame, the length of the rear swing arm, and the length and rake angle of the front forks. Each of these three factors, on its own, has some effect on motorcycle handling. A dozen different bikes with the same wheelbase, which was achieved by a number of different combinations of these three factors may all handle in a slightly different way as a result.

Increasing the wheelbase by lengthening the rear swing arm, for example, may have a couple of side effects in addition to the wheelbase change. First is the fact that the distance from the rear axle to the engine will become greater, resulting in a greater proportion of the total machine weight being transferred to the front end. This may cause heavy steering, a tendency for the front end to plow in soft sand and a slightly different weight bias under many other conditions. If the extra length is added to the rear of the coil/shock mounting location, the longer swing arm will also have the effect of softening the suspension as well as everything else.

The design of the front end has a particularly important effect on the handling characteristics of the motorcycle. The two key factors that we will discuss here, will include that factor called the steering head rake angle and a measurement known as the trail.

The first of these, the steering head rake, is the angle between a line following the centerline of the steering head and a vertical line perpendicular to the ground. The smaller this angle is the closer to vertical the steering head will be. Changing the steering head rake angle is one of the popular methods of changing the handling characteristics of the machine.

Contrary to popular belief, however, the steering head angle itself doesn't actually affect the steering and handling of the bike. It is actually the change that occurs in other factors as the result of the steering angle change that makes the difference, rather than the angle itself.

The primary factor of front end de-

sign with regard to steering response, handling and high speed stability is a dimension that is commonly referred to as the "trail". This term refers to the distance between the point of tire contact with the ground and the point at which the axis of the steering head strikes the ground. The term trail, comes from the fact that in most cases the tire contact point is behind the steering head axis, therefore the tire "trails" the steering. The result is a self-centering effect which tends to keep the front wheel pointed straight ahead when it is rolling perpendicular to the ground surface. The greater the length of this trail dimension, the more pronounced the self-centering effect is likely to be.

Looking from another point of view, the length of this trail is reflected in the steering effect which is imparted by turning the front forks a given amount. In this case, the greater the length of the trail, the less the steering effect will be for a given amount of fork movement. From this it should

The factors that are necessary for good high speed stability are usually quite different from those that are required for precise steering and control at slow speeds.

be evident that where more precise low speed steering control is concerned, a shorter trail length is desirable, while maximum stability at higher speeds requires a greater trail length.

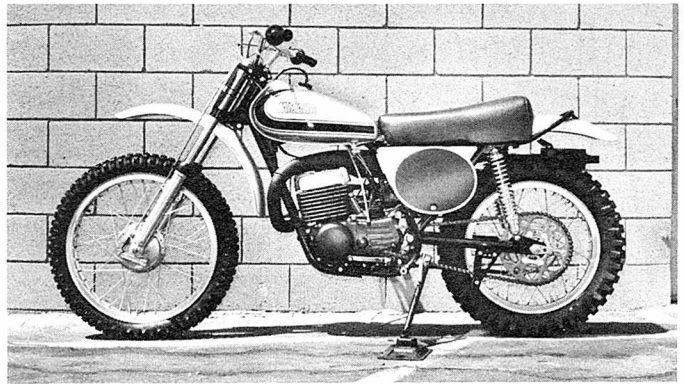
There is a relatively narrow range

within which the length of this trail will usually fall. For most applications the range of this dimension falls between a length of not much less than two inches and not much more than three inches. Slight variations in this measurement can result in definite changes in steering and handling characteristics.

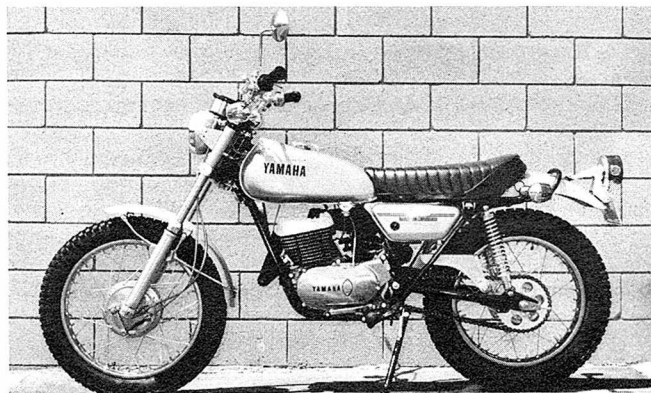
As we mentioned earlier, it is a rather common belief that the steering head angle, or rake, is the factor that



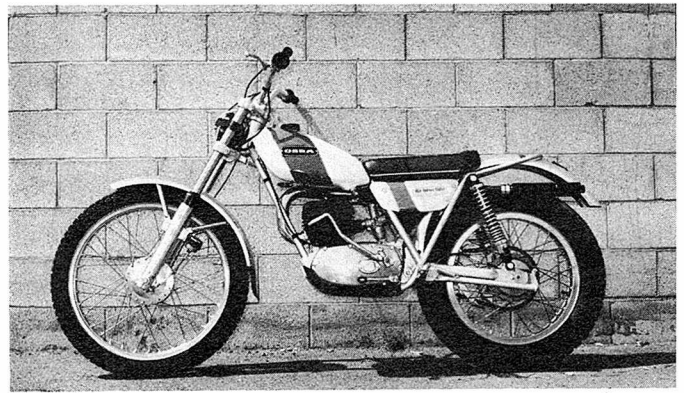
Motocross doesn't require as much ground clearance as many other forms of off-road riding, as illustrated on this 400 Maico. Many factors, however, can't be listed on a specification sheet.



The recently introduced Yamaha motocross machine exhibits a low, rearward weight bias. Deep acting suspension helps maintain ground contact over rough terrain.



Designed as a versatile machine, the Yamaha Enduro provides an interesting contrast to its motocross brother. Front wheel has moderate trail length for stability and steering control.



A trials bike must be extremely maneuverable. Small steering head angle results in shorter wheelbase, greater ground clearance. Short trail length designed into front end gives responsive steering.

is responsible for these handling characteristics, and this may be as good a time as any to look a little more deeply into the factors that make it appear to so many riders that this is true.

The key is the positive relationship which exists between the steering head angle and the length of the trail. This relationship, however, remains constant only so long as the fork geometry remains unchanged. Thus, a specific trail dimension can be designed into any front end with any steering head angle within a reasonable range.

It is true that if you change the steering head angle on your bike a change in its handling characteristics will usually result, however, this change is not due to the different steering rake itself but to the resulting change in trail length. When the angle of a steering head is changed, without changing anything else, the result is a change in the trail length as well. Increasing the steering head angle

under these conditions, increases the trail, and decreasing the angle has the opposite effect.

Relating this back to the discussion on the effects of the wheelbase length, we find a compound result when the steering head angle is changed. Increasing the angle, as mentioned above, will not only affect high speed stability because of the change in the trail length, but also because of the increase in wheelbase. Also affected, at least to some degree, is weight distribution. By relocating the position of the front wheel forward or backward, we change the weight center of the machine and thus change the distribution of weight between the front and rear wheels.

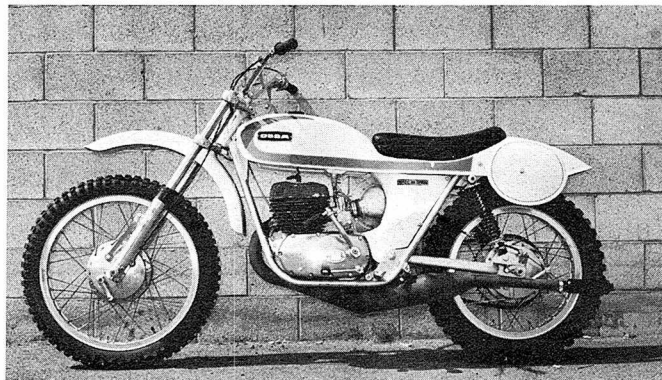
Certain factors, like trail length and wheelbase length have positive and predictable results in terms of performance. Other factors, however, which should by their nature also result in positive discernable changes, do not always do so. Examples of this sort of thing, include: weight distribu-

tion, suspension setup such as spring rates and damping characteristics, engine performance, and many others. In a whole room full of riders, you may not be able to get two to agree on the most desirable setup with respect to any of these factors.

The reason for this is one of the things that makes the motorcycle sport so popular, once you swing a leg over that machine no other single factor has as great an impact on total performance. The physical characteristics of each rider as well as the way in which he reacts, both will affect the handling and performance of the bike. In many respects, the final question becomes one of comfort. The setup that feels the best to a particular rider is the one that he will undoubtedly get the best performance from. It is likely that this feeling will also be translated, by the rider as good handling. What makes a dirt bike handle? When all else is said and done, the smart money is still with the rider every time. ●



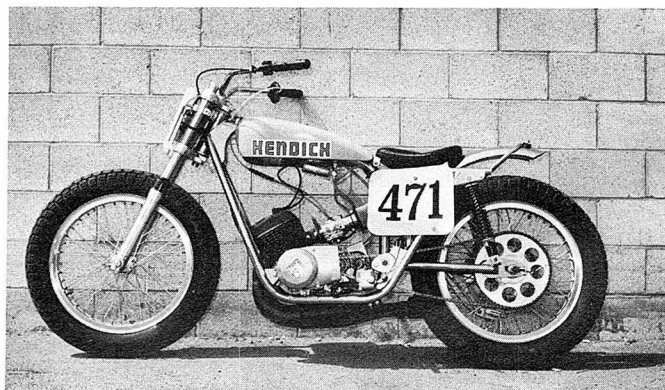
Suzuki has enjoyed great motocross success recently with this combination. Front end geometry provides relatively long front trail length for stability at higher speeds.



This is an Ossa motocross bike. The wheelbase is slightly longer than the similar enduro model, a result of the greater steering head rake angle.



An enduro machine, this Ossa Pioneer has a moderate wheelbase and good ground clearance. The steering head rake angle is less than a motocross bike, but greater than a trails model.



Designed for a very specialized purpose, this flat track machine by Trackmaster embodies small steering head angle, low center of gravity, and weight balance to cope with the requirements of flat tracking.

HOW TO HIT THE TRAIL
SO IT WON'T HIT YOU BACK!



Cow trailing can be "Outta Sight" fun, or a painful bummer. Here's how to make it fun.

Ask five people their impression of cow trailing, or off-road motorcycle riding, and chances are good that you'll get five different answers. One thing they'll all agree on however, is that it's a whole lot of fun. Put very simply, off-road motorcycle riding is a gas!

Having said this, we must also say that it can be a gigantic pain in the neck if you don't go about it the right way. There is a certain amount of preparation necessary to off-road riding. If you neglect this preparation, your day on the trail can turn into a sour one. Much as you might like to, you can't just jump on your motorcycle and bomb over the sand. You have to keep your bike in good shape. Nothing can spoil your taste for off-road riding like an unreliable ride, and the main culprit in cases of unreliability is usually poor maintenance.

Much is made of safe riding practices in riding motorcycles on the street, but dirt riding safety is often overlooked.

What we are saying is that dirt riding is a lot of fun, if it is approached in the right way. Dirt riding takes some thought and planning. We would like to suggest a few things that you should watch for to make sure that you have your stuff together.

You'll see some terrain that might be a bit puzzling on the off-road, and we have some tips on how these can best be handled. So hang on while we take a look at how you can tame the trail.

You can't even begin to think of taking a safe ride on an unsafe motorcycle. It does you no good to know how to apply the brakes and use the clutch, if you don't have them. The only possible way that you can keep your bike safe, is to maintain it properly. If done properly, motorcycling can be as safe as anything you can do. If it is done improperly, it can be very dangerous, and there is nothing in the world more dangerous than an unsafe motorcycle.

Your maintenance should begin with a complete cleaning of your motorcycle between rides. By cleaning it well, you can spot any broken or worn parts that should be replaced. Leave it dirty, and you can miss something important. Never take a chance on a part that isn't 100%. If that part should fail you, it could leave you with a long walk, or worse.

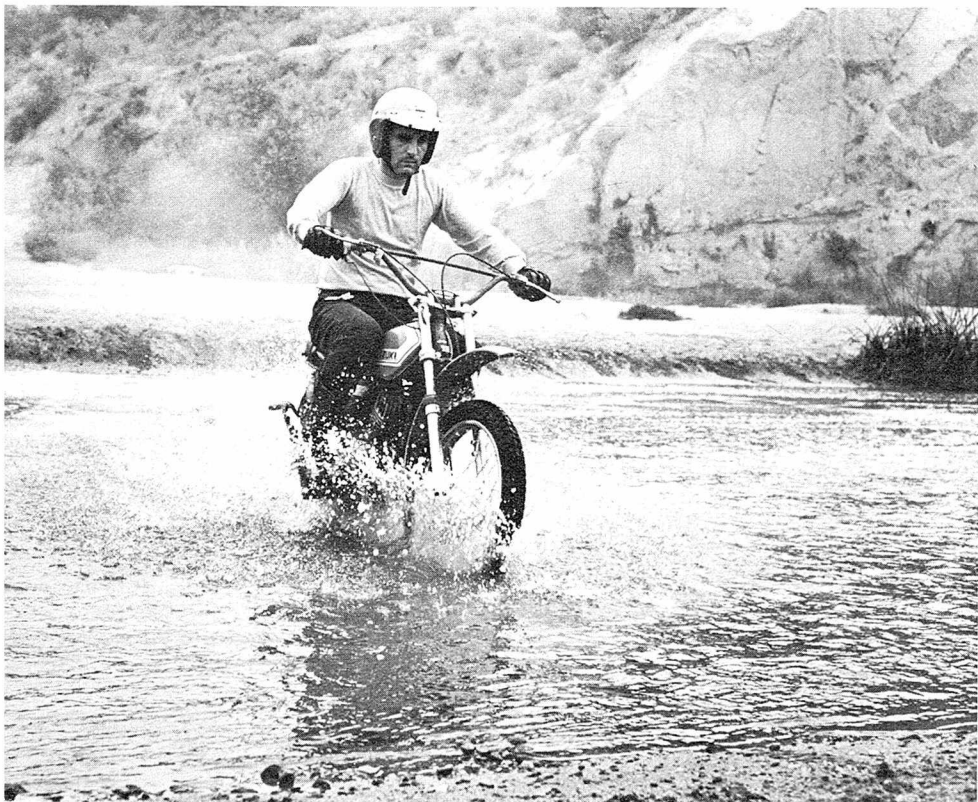
Needless to say, your engine should



Be sure and check your bike out before you take off on it. Make sure that the brakes and clutch are working and that you have plenty of gas.



This is a basic minimum in the way of protective gear for a ride. Never get on a bike without a helmet. Stout boots are a must too. Your basic aim is to leave as little bare skin as possible exposed.



Watch the bank when you are coming out of the water. If there have been several bikes through this spot, the bank will be wet and slick. Take these sections with care.

When you cross water, do it carefully and you won't drown the bike. Make sure that the water isn't too deep before you get in over your head.

be in good shape before you tackle any kind of off-road trip. Besides spoiling a good ride, having your engine stop when you really need it can be flat dangerous.

Be sure to check your bike out just before you get ready to ride it too. It will only take a couple of minutes and will be time well spent. Make sure that the brakes and clutch are in good working order, and be sure that you have plenty of gas. Don't run out in the middle of the boonies.

There is a basic minimum that you should have in the way of protective equipment on your ride. Never get on a motorcycle without a helmet. Your head will not grow back, so don't ever take a chance by going without one. Even if you're "Just going over there," put a hat on. An inexpensive helmet can be the worst kind of false economy. Buy a good lid, it might be your wisest investment.

The season and section of the country you are riding in will help dictate what else you wear, but good stout boots are another essential. A word too on the boots, never wear steel toed boots. If something happens that you should mash your toes, these become vise-like and can be most painful.

For most off-road riding, a long



Deep, beach type sand gives some people trouble. What you want to try to do is skim across the top, if possible. Find the highest gear you can and then dial it on. Try not to dig in too much.



sleeve shirt is preferable, especially if you will be riding near brush or trees. Your trousers should also be strong, preferably leathers. Again, these are a good investment if you do a lot of riding, and a good pair will last some time. If you can't afford leathers, sometimes two pair of denims works well.

Gloves are optional, but recommended. The motocross type with rubber spines in the back of the hands makes running through heavy brush a lot more comfortable. Goggles are also optional, but if you think that you'll be travelling at some speed, they are a very good idea. Especially in the off-road areas you'll be running into some weird things that fly and it smarts when they hit you in the face.

The main idea with the protective gear is to leave as little exposed skin as possible, in case you do come in contact with the ground. Remember too, always the helmet!

There are a few other things to consider in the way of a safe ride, and we might suggest them here.

When you ride off-road it is a good idea to "buddy up." Take a friend along. Besides being a lot more fun, it can be most helpful if you happen to run across some kind of trouble. It's nice to have someone there who can help or get help if you need it.

In some areas of the country, the legislatures have closed the off-road areas to such an extent that you have

Your uphill form will depend on the length and steepness of the hill. Here the rider is able to stay on the saddle with no problem. If the hill is short and steep, you may find it best to be on the pegs.



Try and keep a uniform speed up the hill, if you grab a handful suddenly, you may find the front wheel coming up as it is here.



If you should have the bike go down on you, turn it back down the hill while it is on the ground.

to do your riding on a bike park, or an otherwise somewhat restricted area. Be sure to obey the speed laws, if there are any, and watch for other bikes. Be especially careful where trails converge, or on blind corners. Remember that there are a lot of folks with the same hobby as you, and one of them might be just around that rock.

Don't get carried away with yourself, and go bombing aimlessly across the prairies and get lost. Don't ride further than you can handle. This is especially true early in the season, if you have a season, or if you haven't been out for a while. Many a rider has ridden 'way out only to find that while his bike has plenty of it, that *he* is out of gas. It's a good idea to pace yourself so you're still fresh enough to ride back in good shape.

If you plan to go some distance, carry some water along. Be sure to have some type of first aid trappings with you, even if it is just something clean to press against a wound, if you should fall.

Be especially careful if you are riding in an area you have never ridden before. Check it out before you go bombing off into a ditch or something. Some riding areas will have danger signs posted. Believe what these signs say, they are always there for a very good reason. Watch for dips, jumps, low branches, rocks, and drop-offs. All you need to do is stay awake, and you're alright. After all, this is one of the great appeals of motorcycling, *you* have to ride the bike. A motorcycle can do nothing without you.

Once away from your van, you start running into a great variety of surfaces and terrains. How you handle the trail will determine how much fun you have, so let's take a look at some suggestions for coping with the countryside.

1) Water. You may not encounter any water at all, but if you should, just use your head. If you see that you can cross it, don't just go bombing across. It's spectacular, but it has also been known to drown out a bike. Watch the far bank too. If there have been several bikes through that spot, chances are that it is wet and slick so take it easy coming out. Remember too that your rear wheel will remain wet for a while, so if you should come up on a solid road, don't all of a sudden dial it on.

2) Sand. You may run across a variety of sand, but the sand that seems to give people problems is the deep, beach type. Your general aim here is to pick the highest gear you can and then just dial it on. You don't want a lot of weight on the back, you'll have a tendency to dig in too much. Don't putt it in a low gear and



Keep your hand on the front brake as you bring it back around to where it is aimed downhill. Now you can right the bike and ride it back down. Wrestling a bike uphill can be a battle.



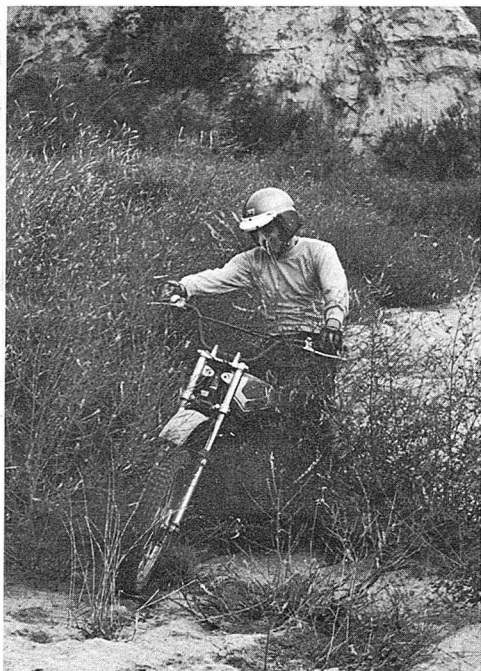
Downhill technique is pretty much the opposite of uphill. You may find that standing is the easiest way to negotiate a steep downhill.



Whoop-de-dos are the rough washboard section of the trail. Sometimes you can beat these by riding toward the side of the trail where you will find it is smoother.



Riding in the mud is very much like riding in the heavy sand. Don't dig yourself a hole. Pick the highest gear you can and power through.



Ride through heavy brush carefully. Sometimes you can't avoid going through, just watch for submerged logs and low branches.



Drop-offs can take you by surprise and some of them can be severe. Pull back some on the handlebars and try to land on the back wheel. Landing on the front can cause some problems.

dial it if you stall, you'll be up to the chain before you know what happened. Mainly you want to stay light on the bike and skim across the sand, if possible. Sometimes this is best accomplished by standing on the pegs.

3) Uphills. How you take a hill will depend largely on how steep it is and how long it is. If the hill is short and quite steep, you may find that you are standing on the bike. A longer more gradual hill can be taken comfortably on the saddle. The main thing is to try and maintain a constant speed as you go up. If you get on it a little hard, you may find the front wheel coming up on you. If the bike should get away from you, you should get away from it too. Let the bike do its own thing and then get it when it stops. There is a proper way to get it back down from this spot too. While the bike is on the ground, turn it back so that it is facing downhill, then right it and ride it back down. Trying to wrestle a motorcycle uphill can be a losing battle.

4) Downhills. The downhill technique is pretty much the reverse of the uphill. If it is steep, chances are that you'll be up in the saddle. Otherwise, sit down, relax and enjoy the ride.



You can go over logs if you have to, as long as you do it carefully. It is best to be on the pegs and pull back some on the bars. Just try to ease it over.

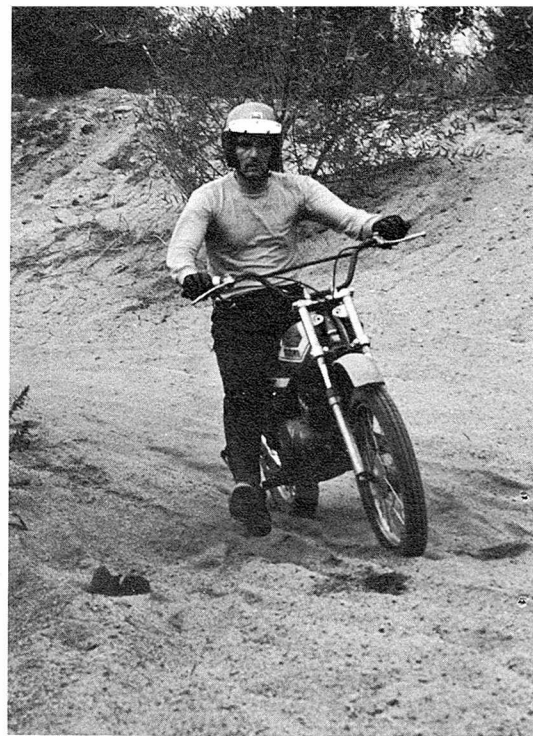
5) Whoop-de-doots. This is that wonderful section punctuated by a quick little jump or dip every few feet. It is much the same as riding on a giant washboard. If this section is on a trail, you'll usually find that the extreme sides of the trail will be smoother. So don't ride right down "Main Street" and hit the worst spots, if you don't have to. Being up on the pegs and trying to keep the front of the bike "light" is the best way to handle this section. Try not to keep coming down hard on the nose wheel in the depressions. It will take some practice.

6) Mud. You'll find that the techniques for riding in heavy mud are much the same as they were for riding in heavy sand. Again, you don't want to dig a hole for yourself in the mud. Pick a high gear, and try not to stop. If the mud has been traveled, you may find existing ruts in it, pick a good rut and stick to it if you can.

7) Heavy brush. You may sometimes find that you are unable to avoid

riding in heavy brush or undergrowth. If you do get into one of these areas just make sure that you watch for things like hidden logs and overhanging low branches. Areas like this make you glad that you wore long sleeves and good pants.

8) Jumps and drop-offs. Be especially careful of jumps. These can be fun if you know what you are doing, they take a lot of practice. If you are unfamiliar with jumping, it's best not to try it. If a jump comes up unexpectedly, it can throw you, literally, so watch for them. Your main aim in jumping is to give the bike enough gas so that you will have power enough to fly. You can't be lazy here or you will come down on your nose. Pull back lightly while in the air, and come down on the rear wheel. Slowly dial the power on as you are coming down and as you land you should be in good shape to carry on. If you come down on the front wheel, you may be out of shape, so try to keep the front up. The same goes for going off a drop. Always try and land on the back wheel and you'll be in much better shape. On an ordinary trail ride you probably won't have to be concerned with jumps, but it's handy to know how to do it just in case.



A dab with your foot might just be all you need to get you through a corner successfully. Your foot should be well out and parallel with the bike.



Be especially careful where trails intersect. Remember that there are a lot of guys who share your hobby, so ride carefully. Sometimes the bike parks are as crowded as the streets.



When riding through sections of trees, be careful of low branches. Also be ready for somebody to come from the other direction on narrow trails.



This is what can come of a sudden jump if you don't see it in time. Watch for just about anything when you are out on the trail.



Once the ride is over and you have taken your boots off, it's best to call it a day. Don't go back out when you are tired, and don't push yourself when you're fatigued. You can get in trouble riding tired, save it for next week, it will still be there.

9) Logs. You may occasionally come across a log and the idea here is to sort of ease yourself over. Make sure that you are not going to hang

up on it, stand on the pegs and pull back some on the bars. Of course, you don't try this at 60 miles per either.

10) Cornering. You may have to use some cornering technique if you find that you went in a little "hot." If you need to, extend your leg well in front of you, with your foot parallel with the front wheel and then do your "hot shoe" number. This little "dab" will provide you some support. Another hint on cornering is to be in the proper gear before you reach the corner. Then you can go through and out the other side without having to search for a gear and coming up with a foot full of neutral.

The areas we have discussed are pretty representative of what you'll find when you go out for your off-road ride. If you have used your head, it was a lot of fun. The more you do it, the better you become, and the more fun it is.

Another important thing is to realize when you've had enough. Once the ride is over, leave it alone. Many times people go back out when they have rested for a while but are still fatigued, but this is a good time to get in trouble. Don't ride tired. Save it for next week. That desert is not going anywhere and it will be there for you to enjoy. That is if you don't do anything foolish today.



MOTORCYCLE IGNITION SYSTEMS

HOW AND WHY THEY WORK

The heart of your bike's power plant, here's the way they work and how to keep them working.

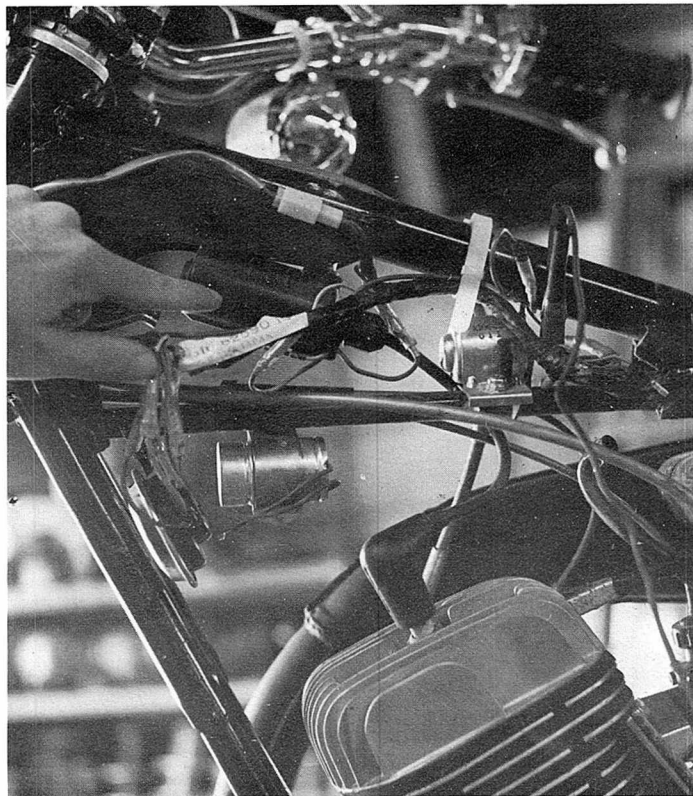
The ignition system in your motorcycle is an important factor in its overall performance. If the ignition system is not functioning as it should, not only will it be impossible for your

bike to perform as it should, but basic functions such as starting ease and general reliability will be affected. The actual task of the ignition system is relatively simple to define. The ignition system is responsible for igniting the fuel mixture in the combustion chamber at the precise time when that ignition will result in the production of power in the engine. In actual practice, however, this process is easier to explain than it is to carry out. To be able to better appreciate and

analyze the role of the ignition system, let's take a brief look at the events that occur in the process of producing power.

In one form or another, a fuel mixture which is comprised of gasoline and air is brought into the engine and compressed into the combustion chamber. This compressed mixture is then ignited by a high voltage spark which bridges the gap between the spark plug electrodes.

The burning mixture produces a great deal of heat which expands the compressed gases, forcing the piston downward. The force of this downward moving piston is eventually translated into power at the rear



The coil is the heart of the ignition system, converts low voltage current into high voltage needed to ignite fuel mixture.

wheel. It is important to realize that the combustion process is a burning process, and not an actual explosion. This burning occurs at a specific and normally constant rate, so that a certain period of time is required in order for all of the fuel mixture to burn. This makes the timing of the ignition particularly important.

The high voltage spark which is responsible for igniting the fuel mixture may be created by one of several methods. Although there are many different variations used on motorcycles, most of these fall roughly into one of three different categories: The battery/coil ignition, The flywheel magneto ignition, and the Capacitive Discharge Ignition, usually referred to as the CDI system.

The most basic and relatively common ignition system is the battery/coil type system. We'll start by examining this system to see how it works and how to keep it working properly. As the name implies, the energy source for the battery/coil type system is a storage battery. The low voltage from the battery is converted into the high voltage that is required to ignite the fuel mixture by a process known as electrical inductance.

The key to the whole process is the ignition coil. The ignition coil is actually composed of two coil windings. When current is passed through one

set of these windings, an electromagnetic field is created. When the current is stopped from flowing to these primary windings the magnetic field collapses. As the field collapses, the magnetic lines of force pass through the windings of the second coil, inducing a high voltage current in this secondary coil. This current has only one path to escape, through the coil wire to the spark plug. Upon reaching the spark plug the current flows down the center electrode and jumps the gap to the ground strap. The spark created when this gap is jumped causes the ignition of the fuel mixture to occur.

Although the ignition coil is the heart of this type of system, one of the most important factors for the correct operation of the system is the ignition breaker points. The breaker points act as a switch between the battery and the primary windings in the ignition coil.

The breaker points are opened and closed by a cam. In the battery/coil system the opening and closing of the points has an effect on two factors in the ignition process. The length of time which the points remain closed, affects the build-up of the magnetic field in the primary coil windings. The point at which the points are opened, relative to crankshaft rotation, determines when the magnetic field in the coil is collapsed and thus when the ignition spark will occur.

In terms of care and maintenance the two primary areas of concern are

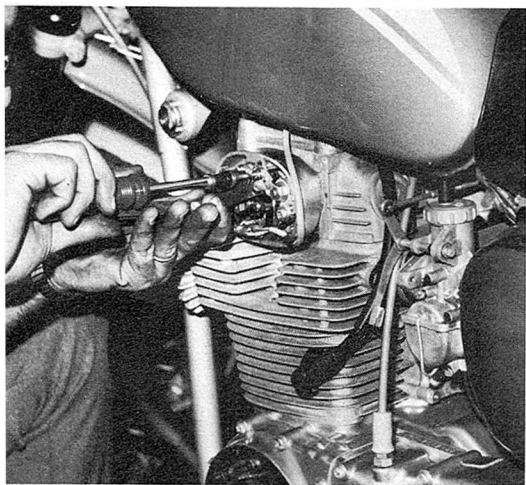


Most two-stroke dirt bikes use a form of the magneto ignition system, because of its simplicity and light weight.

the breaker points and the spark plug. In the spark plug, the gap between the center electrode and the ground strap must be set carefully to the prescribed specifications. If a used plug is cleaned and re-used the electrode and ground strap should be dressed to present flat surfaces and crisp edges before the gap is adjusted.

Two adjustments are usually necessary for the ignition points. First, the gap is adjusted to the required measurement at the widest opening point. Second, the ignition timing is adjusted by causing the points to open at exactly the right time in relation to crankshaft rotation. This ignition timing is usually adjusted by rotating the ignition point base plate in relation to the point cam. One important factor in working with the breaker points is cleanliness. Even a slight amount of dirt or foreign matter on the breaker points can affect current flow and lead to premature point failure.

Once used almost exclusively, the battery/coil system is becoming less popular, particularly for dirt bike applications. The reason for this move to alternative systems is partly the result of several inherent weaknesses in the battery/coil system. Undoubtedly one of the reasons is the fact that battery/coil systems require the use of a battery and related charging equipment, excess baggage when



In a battery/coil system proper point adjustment is essential to allow the coil to produce the necessary current.

other systems don't need them.

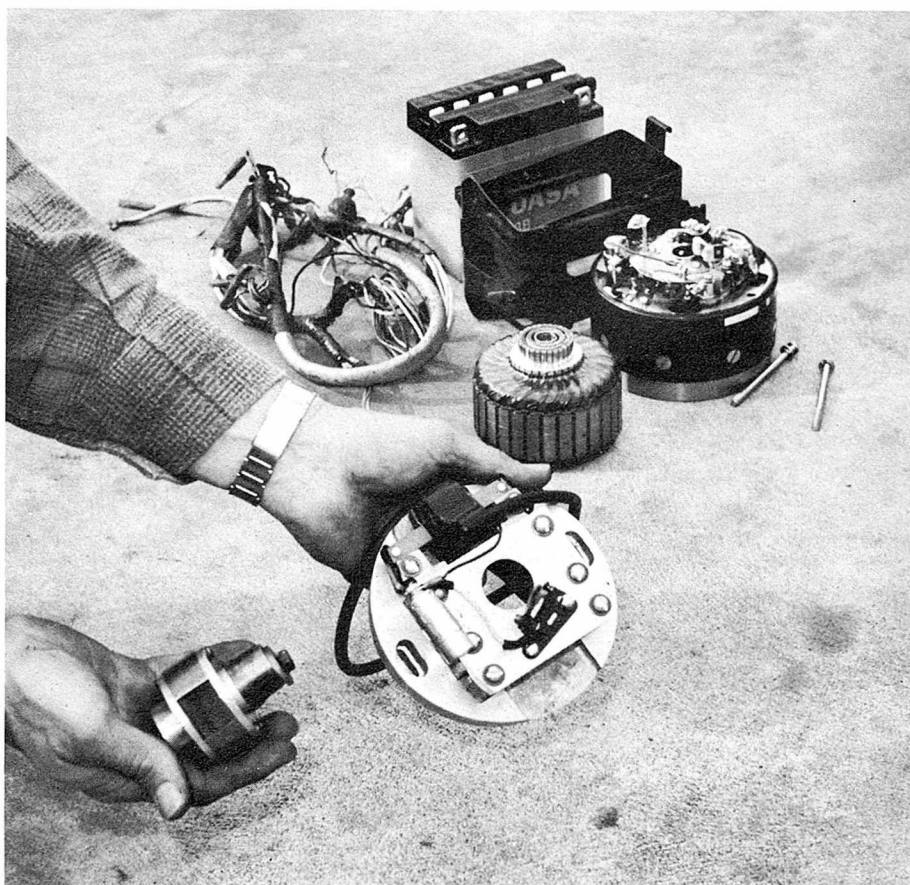
In terms of performance, there are also other reasons. Since the primary power source is a battery, current flow to the primary windings of the coil occurs at a constant rate. As engine speeds increase, however, the length of time during which the points are closed is shorter. This can result in a lower voltage build-up at higher engine speeds, at just the time greater voltage is required.

The solution to both of these weaknesses can be found in a magneto ignition. The magneto system doesn't require a battery and offers the further advantage of providing greater voltage output at higher engine speeds, making it ideally suited for high performance applications. In the common magneto system, breaker points are used to control the transmission of current to the high tension coil and on to the spark plug.

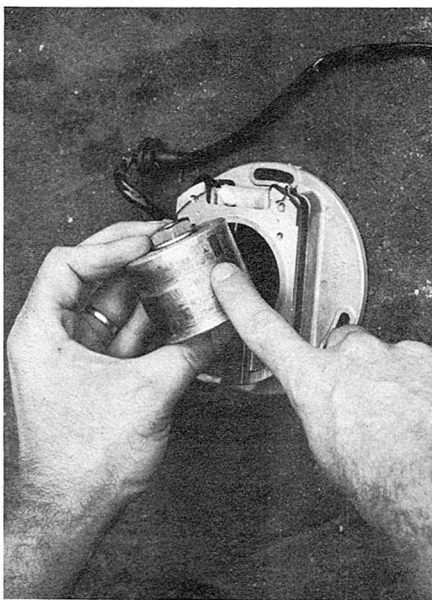
The timing of the spark in a magneto system is controlled by the opening of the ignition breaker points, much in the same way that the timing is controlled in a conventional battery/coil system. The only adjustment that is usually required, however, is to cause the breaker points to open at the precise time that the spark plug must fire.

The magneto system generally requires less maintenance than a conventional system, and the breaker points tend to last longer.

Replacing the magneto in the place of favor among dirt bike enthusiasts is a new system known as the capacitive discharge ignition. One of the key advantages of the CDI system is the fact that it uses no contact breaker points. The result is minimum maintenance and maximum reliability.



This capacitive discharge ignition unit is designed to replace a standard battery/coil system, the various pieces of which are shown in the background.



The small magnet visible on the surface of the flywheel combines with a rectifier to replace the breaker points in this CDI system.

The CDI system is in most respects very similar to a standard magneto system. A magneto flywheel contains permanent magnets which pass by a primary coil as the engine rotates, which causes a build-up of electrical current through electrical induction.

From the primary magneto coil, the current goes to a capacitor where it is stored before being passed on to the high voltage coil and the spark plug. In the standard magneto system the job of passing the current at this point is handled by the breaker points.

In the CDI system employed is a small magnet on the flywheel which generates a signal that is picked up by a silicon controlled rectifier each time that spot on the flywheel passes. When the rectifier picks up this signal, it discharges the capacitor to start the ignition process.

Regardless of the type of ignition system that is used on your dirt bike, proper care and tuning is the key to top performance. Although the different systems have their own advantages, about any well tuned ignition system in good condition will do the job under most conditions. Learn your particular system and its special maintenance and tuning requirements, the dividends will be greater reliability and top performance from your machine. ●



NEVER TOO YOUNG

New bikes, enthusiastic parents, and turned on kids. A combination that is producing the best young riders ever.

Recently at the International motocross in the Los Angeles Coliseum, Marty Tripes set U.S. motocrossing on its ear by winning the event. It was only the second time that an American has won a competition with the European riders. That was startling enough, but what was even more impressive was the fact the Marty Tripes was just 16 years old!

Impossible you say, not hardly. Tripes was good enough last fall to ride in the International series, but the minimum age for riders was 18 and he was only 15. The AMA has low-

ered the age to 18 and opened the door to some fine young riders.

What has happened is that the kids of today have some advantages in motorcycling that their parents never dreamed of. And as they should, they are taking advantage of the breaks.

When many of these youngsters parents were growing up, the only motorcycles available were some of the old monster bikes. Besides being an absolute fistful to try and handle, these bikes represented a fairly sizeable investment. It was not nearly as easy to own a motorcycle in those days as it is now.

Now, virtually every company makes a mini-bike or a mini-enduro which is ideally suited for the youngster. Instead of having to straddle some 500-pound monster, the kids now have bikes which are practically "tailor made". This means that kids can begin riding much younger and grow up with motorcycles until they are up to the full sized ones. By that

time they have been able to log plenty of riding time and are quite good at it.

With motorcycling enjoying immense popularity right now, the parents are also turned on to the sport and can lend invaluable assistance to the beginner. With the wide range of motorcycles available, motorcycling has become a real family sport and a kid and his dad find something they can enjoy together. In fact this is helping to smooth and close some of the generation gap. There's little difficulty communicating about motorcycles. They can work and play on them together.

The parental assistance, aside from being nice, is quite crucial. Early instruction is most important on a motorcycle. This is where the habits that will last a long time are formed. It's much better for a kid to have encouragement and good solid instruction from his dad, then to have to rely on one of his buddies with not much

more motorcycle mileage than himself.

If the young motorcyclist today will apply himself, he can take advantage of opportunities that didn't even begin to exist for some of the top riders in the world, some of them competing even today. He can turn this advantage to a great gain.

What most young riders don't pay enough attention to is the mechanical side of motorcycling. They see the International Experts waited on by a swarm of mechanics and figure that is the way life is going to be. Nothing could be further from the truth. The factory rider can probably dismantle and reassemble his motorcycle blind folded. And at some point, even the great Joel Robert had to ride some real junk. His secret was that he was able to keep it together and make it go faster than the other guy. Our young riders have much better basic equipment to work with but must be ready to get their hands dirty.

If a kid uses his head, he can collect everything he can get his hands on pertaining to motorcycles and build himself a nice reference library. It is important to know how *motorcycles* work, not just *your* make. Here again, dad can help out a lot with direction to help with the work. We don't mean for the young man to bring his new bike home and immediately tear it apart, and not knowing how to get it back together, watch it rust to death. But know what makes them tick.

Kids have to realize also that a motorcycle is not a toy and is definitely not something to show-off on. If you have to show off use something besides a motorcycle, they can hurt you.

At the same time, it is not *necessary* that a motorcycle hurt you at some time. If you learn how to use the bike properly, and use your head when you are riding it, there is no reason that you absolutely *have* to have an accident.

Another advantage the young riders have now is the motocross school which is run by the Expert riders. Many times these are held in conjunction with an all Junior motocross program and the youngster can pick up some valuable tips from the pros. Going to watch the top motocross racers is another way to learn. But they have some bad habits too, so be critical when you watch and see what they are doing wrong too! Habits are hard to break so it's best not to develop bad ones. This is why you should always be most serious when you are on a bike and never be fooling around. Don't get careless.

So by starting out on a motorcycle that is suited to the young riders size and ability, and taking advantage of the motocross schools and the many



Motorcycling helps close the generation gap. Dads and sons seldom have trouble communicating over motorcycles.

Youngsters should never get on a bike without at least having a helmet on. This well dressed young rider also has gloves, goggles, and boots.





Parental assistance, besides being neat, is crucial. Kids shouldn't have to learn from friends no more experienced than themselves.



Virtually every company makes some type of mini or mini-enduro. Now instead of having to straddle one of those old "monsters", kids almost have "tailor made" machines.

It is now that young riders begin to develop habits on a motorcycle. Make sure that they are good ones because bad ones are hard to break.



This is good early cornering form. Never ride a bike carelessly, work on your technique.



Junior races, the youngster can build a background that even someone like Torsten Hallman would have drooled over.

As the rider advances in years some and gets into high school, he will have a decision to make about whether he is ready to make a living racing motorcycles. Taking money for riding can jeopardize your amateur standing, so before you decide that you don't want to play football or whatever anymore, it would be wise to check to make sure that you can still play if you suddenly lose your enthusiasm for motorcycle racing.

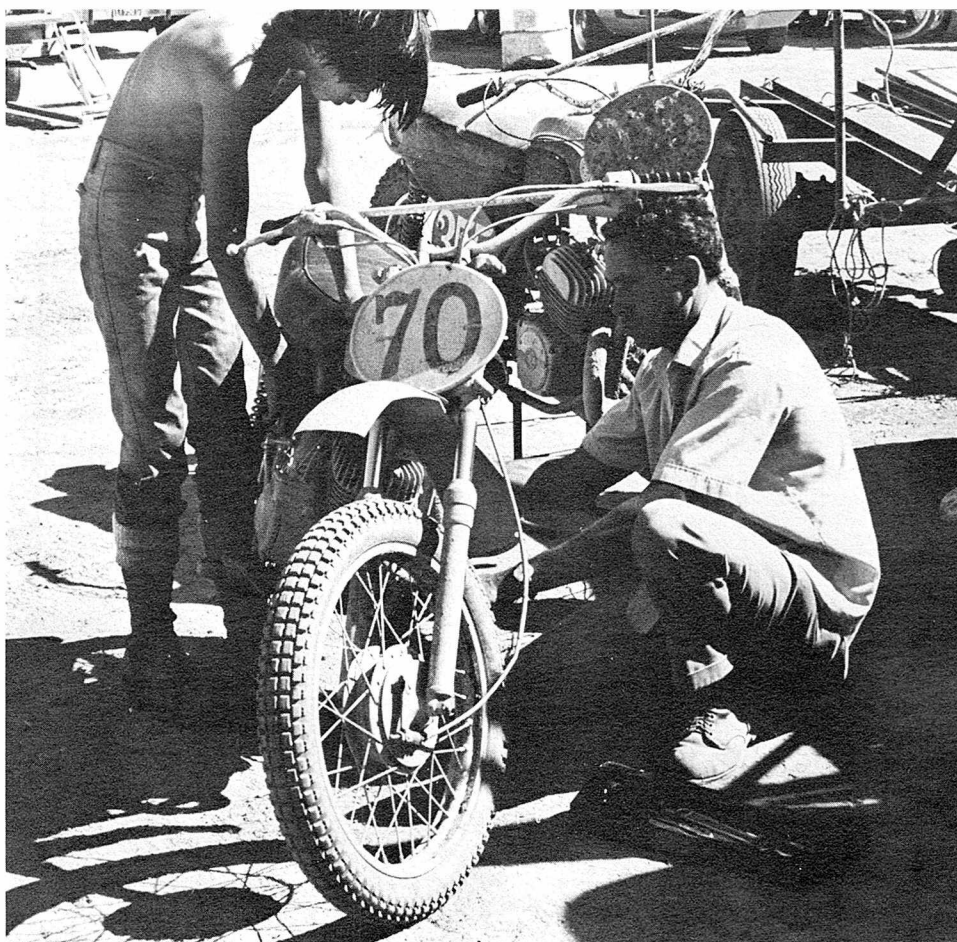
We've talked about racing, but of course, you can have a lot of fun just "cow-trailing" on your bike. The off-road area is rapidly dwindling in some areas of the country, but there is generally plenty of land to ride on in addition to the bike parks.

But whether you are racing or just riding for fun, safety should be a prime consideration. If you are cow-trailing, go with a friend. That way if you should get into any kind of trouble, you have instant help.

Don't jump on a bike that is too much for you to handle. It's impossible to say what kind of bike you should have for what age, but a good yardstick is the size and weight of the bike. If it should fall over, can you lift it off, or can one of your buddies? If not, it may be too big. Don't loan your bike to someone who has to ask where first gear is and then goes bombing off, if he is lucky he'll be back.

Never go anywhere, not even down the driveway without the proper equipment on, and at the bare minimum that is a good helmet. Your head is the only thing that won't grow back or heal so take care of it. Never ride without protection for your head. Wear good shoes or if you're on the off-road, a good pair of boots. You should also have some protection for your eyes, and if you are going through the "boonies" wear gloves. The big thing is that you have a long time to ride and old motorcycle injuries are some of the most permanent things you'll ever see. So don't foul up a career as a good racer or a lot of fun riding by doing something stupid.

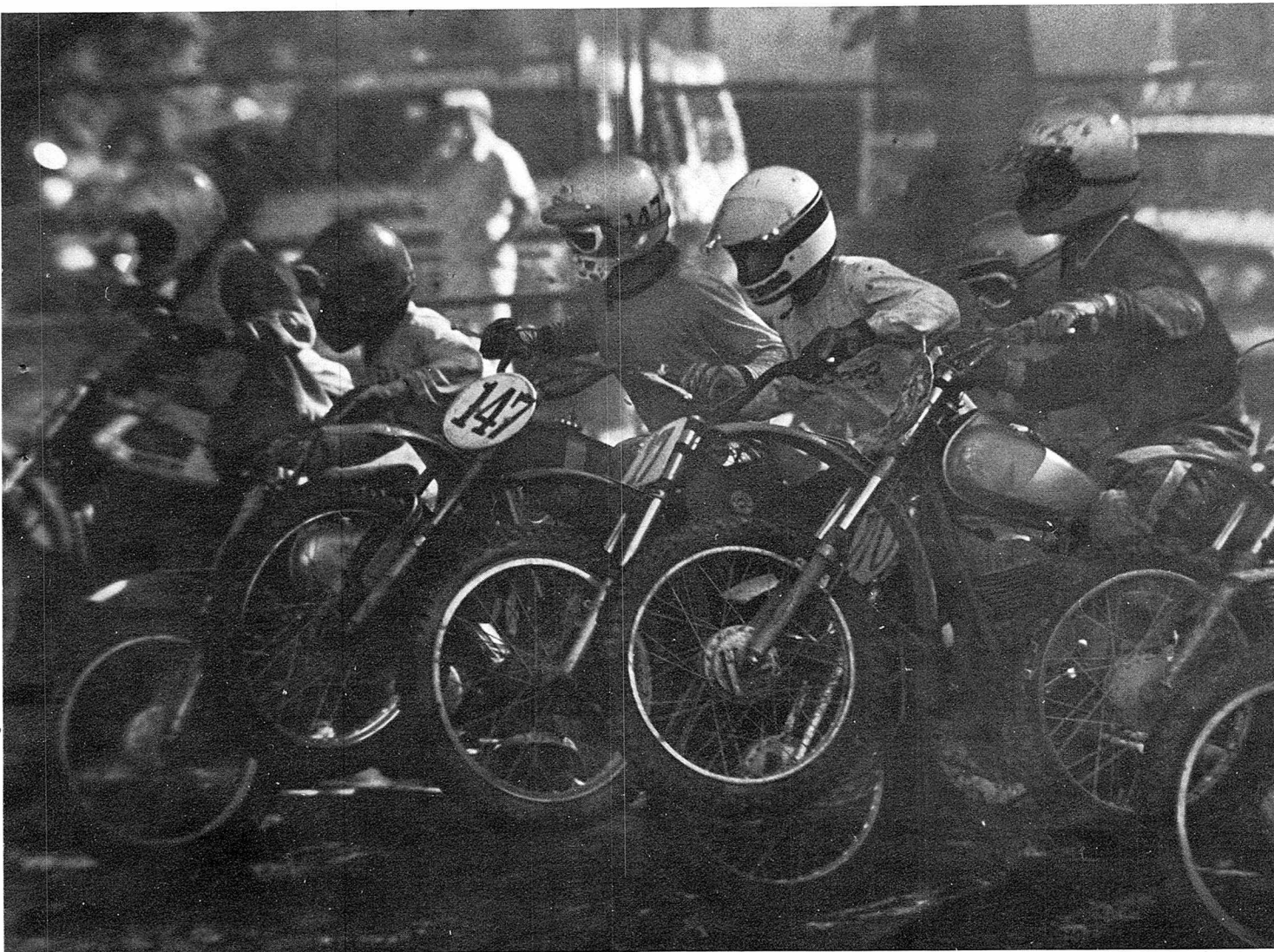
The motorcycle world has never been brighter for the young rider. From the motorcycles at his disposal, to the expert advice at his command, there is really no reason why we can't produce a world motocross champion before too much longer. Guys like Marty Tripes are taking giant steps in that direction and well they should because at no time in the history of the U.S. surely and possibly in the world, has the young motorcyclist had it so good. ●



This series shows one race in the life of young Hector Hernandez. Here Dad helps with the preparation of the bike in the pits.

At this point, the support is gone. You are left alone to think about what you have to do.





Hector, second head from the right, gets squeezed out at the start. These guys play for keeps! -



After a spill, Hector is left pretty much to himself on the course. But the solitary rider plugs on to the checkered.



It's over and it hurts, but with his young pit crew to hold his gloves, he regroups for the next moto.



GET IT THERE IN ONE PIECE

Careless loading can cause damage and ruin a fun day in the dirt. Don't break your bike before you get there.

Someone once said that, "Getting there is half the fun." There may be days though when you're convinced that this joker wasn't talking about hauling motorcycles. But transporting motorcycles doesn't have to be a pain in the neck, provided of course that you know what you're doing, have good equipment to do the job, and take your time.

As you already know from having bought the motorcycle, it cost money.

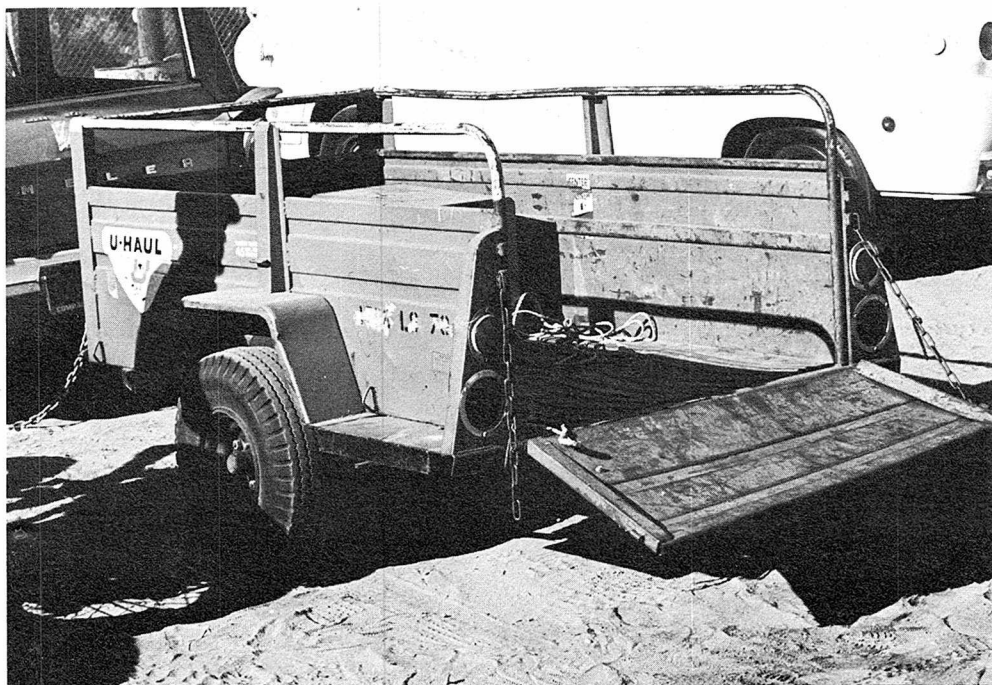
Depending on the particular motorcycle, it may have cost a whole lot of money. So don't jeopardize your day of fun riding, or the chance to pick up a few bucks on the motocross course, because you just threw the bikes on the back of a truck with some string. You may get where you are going only to find the motorcycles nicely scrambled.

What strikes you on arriving at a motocross, desert race, or bike park, is that there are just about as many ways of transporting a motorcycle as there are folks transporting them. Their ingenuity (or disingenuity) is amazing. You will see everything from crude, home made model trailers to vans; and from "U-Rent" trailers to luxurious camper models. But whatever mode of transportation you

choose for your motorcycle the goal should be the same: to get it there safely and in one piece. We might also add at this point, legally.

You will find that in some areas, police are especially sensitive to the motorcyclist. In fact, their view of the motorcyclist is downright microscopic. Of course, there are always the few "eight balls" that provide the law with more than enough excuses to bust them. The way that some folks move motorcycles around is dangerous.

Your best bet would be to make an effort to see what is required in your area in the way of hauling bikes. If you are using a trailer, be sure that it is in good shape. Make sure that the taillights and brake lights are working. And *don't* have the trailer



You see just about every conceivable type of carrier at the races. If you use a trailer, be sure the brake and taillights work.

loaded with bikes *and* kids. You don't have to go too far to see some kid sitting on a motorcycle that is being trailered. How's that for asking for trouble?

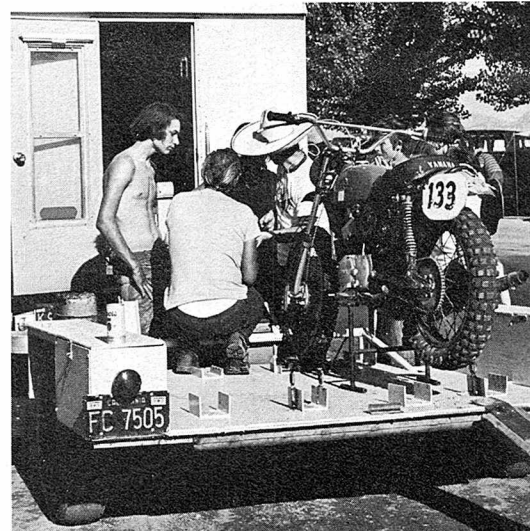
Don't have the bikes hanging out of the trailer or truck. If it will only take two or three, don't try five!

Another thing that you would be very wise to check if you have a van, is to see if commercial plates are required if you have bikes in the back. This is like shooting fish in a barrel for some of the local gendarmes and they often get writer's cramp on a Sunday outside a bike park. Many times it is a case of people just not realizing that they are illegally transporting their bikes.

Make sure that your bike, or bikes are well tied down and that they won't be wandering all over the place. If you tie them down well, you won't have to drive around like you have a load of "Nitro" in your truck. It isn't essential that you have anything real exotic for tie-downs. There are many companies making all kinds of webbing and similar material. But you can get by with some stout nylon rope if you just use it properly.

The same goes for a ramp. It is possible to buy nice, lightweight manufactured loading ramps for use in loading motorcycles. But a trip to the local lumber yard can yield pretty much the same results.

Be sure to leave yourself some room to see after the motorcycles are loaded. This may require some large side mounted rear view mirrors. If you



Here's a three bike home made model that even has room for the tools. Notice the metal plate which makes the plank easier to use.



There are many fine, lightweight commercial ramps made. Note the single bike is loaded in the corner of the truck, this helps vision and keeps the bike in place.

are loading just one bike, put it in a corner where it won't be in your way.

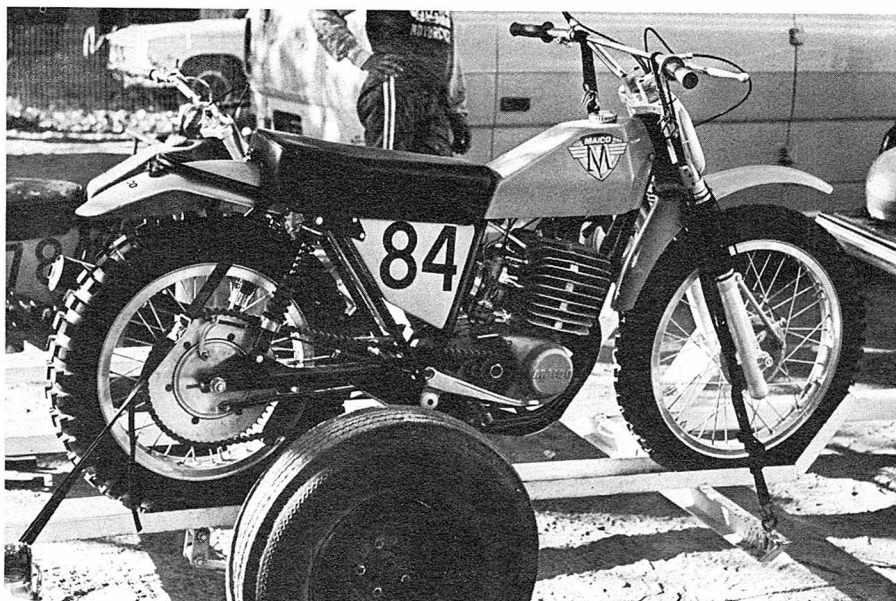
The most natural and easy place to push the motorcycle is from the left side. You should dismount on that side and the kickstand will be on the left side also.

Tilt the bike slightly toward you as

you push it, it is embarrassing, not to mention damaging, to have one tip over on you. Leaning away from you, it can sometimes get away.

If you do make your own ramp, do yourself a favor and cut it long enough so that it will stretch from corner to corner of your truck or trailer. The result will be a gradual slope that will be easy to negotiate.

As you push up the ramp, have your hand near the front brake at all times, if something happens you can stop the bike immediately. Watch for the



This commercial trailer is complete with eyelets for the tie-downs. These are essential if you are to do much carrying of bikes.



If you have a van, check the local laws. You may have to have commercial plates to carry bikes legally.

end of the plank coming up on you as the bike gets near the top. And for your added health and welfare, if you are ever around a loading in progress, don't straddle that plank!

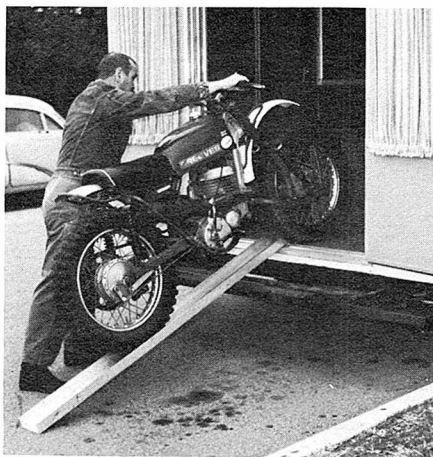
Once up, if you are loading just one bike, tuck the front wheel in a corner. This will keep the bike from wandering and also provide you with a clear line of sight out the rear.

Putting the kickstand down will provide you with a nice three point base. A stout rubber band made from an inner tube comes in quite handy when you wrap it around the front brake to help keep the bike in place.

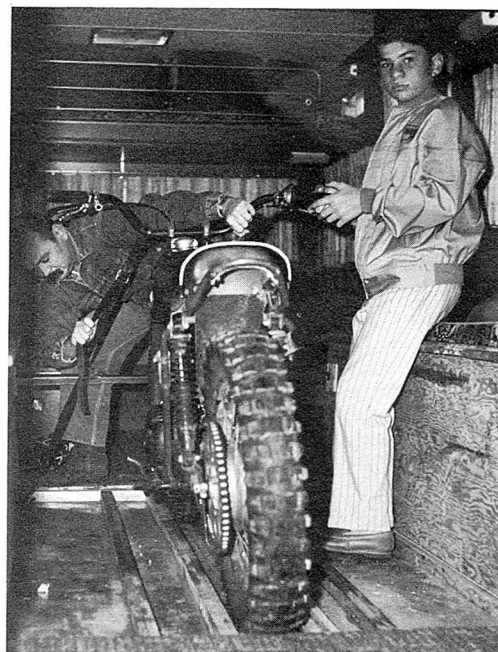
Using the eyelets (which you should have if you are going to be carrying motorcycles) use your tie-downs and secure the front and rear of the bike. If you are carrying just one bike, put your second tie to the other side of the truck or trailer, but always try to have two ties on the front and back. It never hurts to be extra safe. Now, if you have a truck, putting the tail gate in place will tie the bike in quite nicely, ditto for a trailer with gates.

And that basically, is the trick. Again, if you take your time and use your head along with the proper equipment, you can get to the bike park or the races with a minimum of hassle and have your fun. If you don't, you can always head for the nearest swap meet to see how many of those parts you can get rid of.

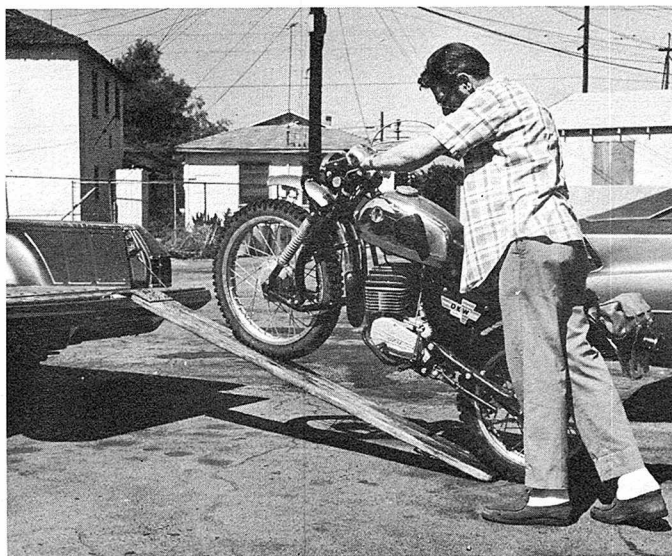
Of course, all of the careful loading will go for naught if you don't then drive carefully. Obey all laws as they pertain to pulling a trailer, or whatever you have. Remember, every time you have a truck or trailer load of motorcycles, you are a rolling public relations man for the sport. You can make a real impression on the public, the question is, will it be good, or bad?



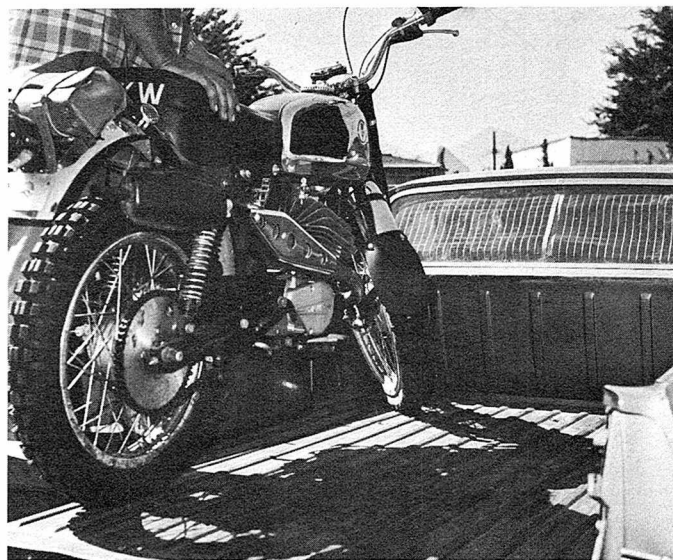
Notice that the loader's hand is right on the brake. In case the bike should do something "freak," you can stop it in a hurry.



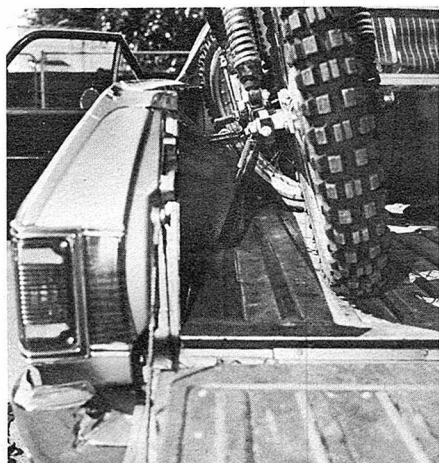
This "Smuggler" from Journeyman Industries is one of the more luxurious ways to transport your bike. There's loading space for three bikes.



Cutting your home made plank long enough to fit corner to corner in your truck will provide you with a nice gradual rise. This can help at the end of a long day.



Tucking the front wheel up in the corner will help keep the bike in place. Notice too the clear access for the rear view mirror.



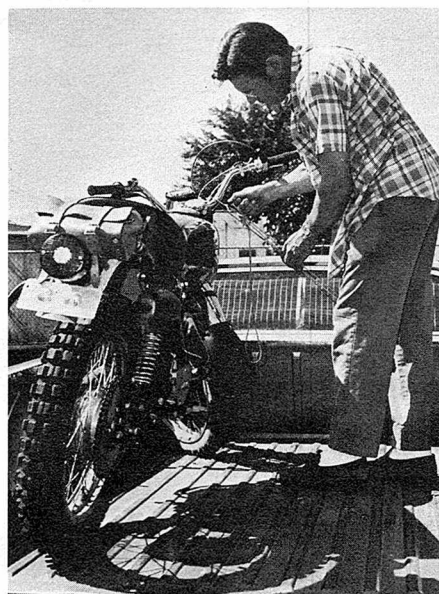
Putting the kickstand down will give you a nice three point base. Your main goal is getting the bike there in one piece.



Notice the good, stout eyelets on the wheel well. If you are going to carry bikes, these are almost a must.



Cut yourself a rubber band from an inner tube. Wrapped around the front brake, this will help keep the bike in place.



Try and tie the bike down from both sides, front and back. If you don't have the commercial webbing, good strong line will do just as well.

With the tailgate up, the bike is safe and snug and ready to go. But all this will be wasted if you don't drive safely, so take it easy. You will be on display as a motorcyclist.

TUNING YOUR DIRT BIKE

The proper tune-up is important for top performance. Here's the run-down for both the two-stroke and four-stroke type machines.

Off-the-road riding is often demanding, on both the rider and the machine. Usually, a wide variety of terrain requires power, response, and reliability from your engine, like no other form of motorcycle sport. In order to get the greatest pleasure from your riding, requires that your motorcycle deliver all of the performance that was designed into it. Getting the maximum performance from your engine means, among other things, that the engine must be kept well tuned.

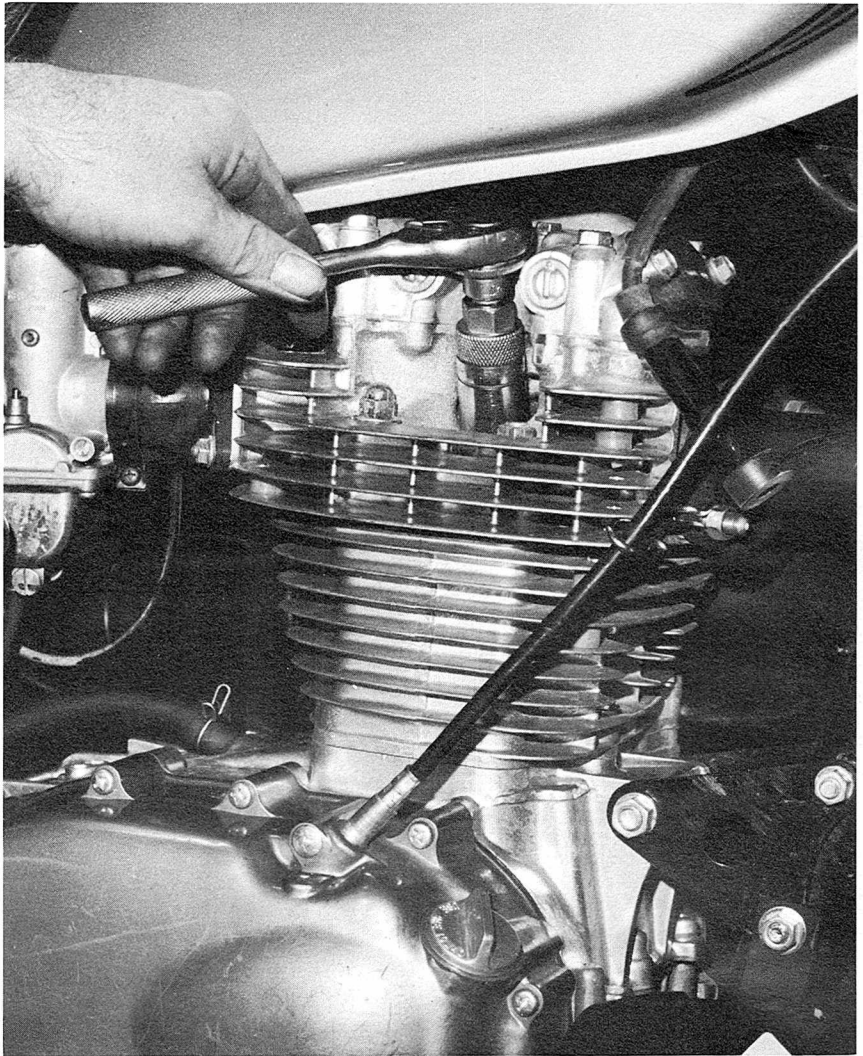
Most tune-up procedures are simple enough that just about anyone can perform a successful tune-up if he goes about it in the correct way. Most tune-up procedures follow roughly the same pattern. The primary differences are found in the relative procedures required to tune a two-stroke engine as contrasted with four-stroke engine procedure. In the following article we will run through the typical steps required in both types of tune-up operations.

There are no real secrets to a successful tune-up, however, there are a few tips that will help insure your success. To begin, plan ahead. Learn as much about your specific engine as you can. There are excellent shop manuals available for most models, and one of these is an investment well worth making. Learn the required specifications for your particular model and follow them to the letter. Finally, take extra pains to be neat and clean during the tune-up. A little dirt that gets in the wrong place can do more harm than the tune-up did good.

FOUR-STROKE TUNE-UP

To serve as an example for our four-stroke tune-up, we used the popular new Honda XL250, a single cylinder four-stroke. Although some of the specific specifications for the Honda may be different, the basic operations will follow for most four-stroke engines.

FOUR-STROKE TUNE-UP



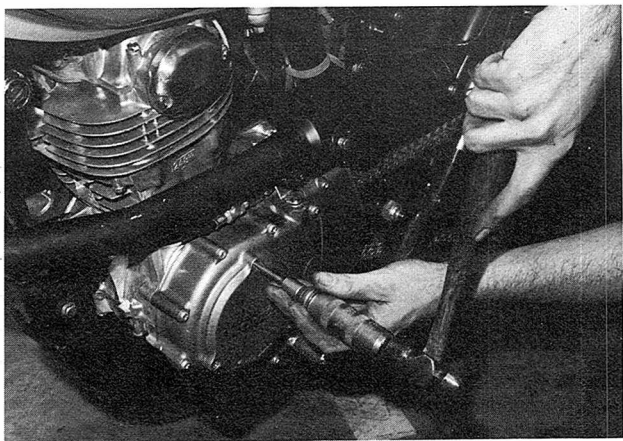
1. The first step in the tune-up operation is to remove the spark plug, since its removal makes many of the following operations easier. The spark plug itself can be dealt with later in the tune-up.

The first step in the operation will be to remove the spark plug. Since several of the operations will require turning the engine over, removing the plug at this point will make the rest a little easier. When the spark plug is removed, you can set it aside and we'll get back to it a little later.

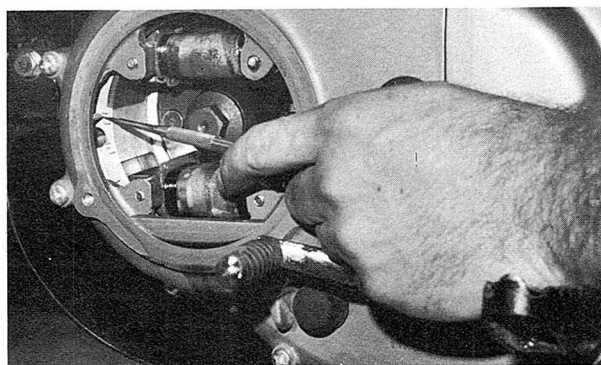
The next step is to remove the covers from the points and generator. Examine the breaker points to determine if they are worn or dirty. Use a point file to clean the points if

needed, or replace them if necessary. To set the point gap, rotate the engine until the point block is resting on the highest point on the cam lobe, and use a feeler gauge between the ignition points. On the Honda the recommended point gap is .012 to .016 inches.

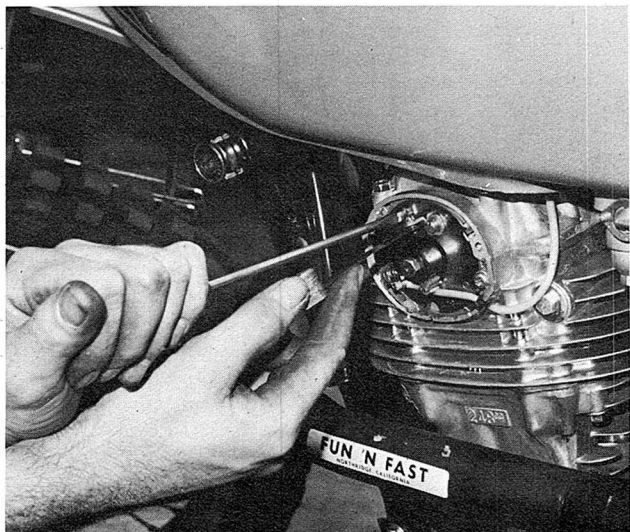
After the point gap has been correctly adjusted, the ignition timing can be set. The timing marks are usually located on the flywheel, with a corresponding stationary marker on the



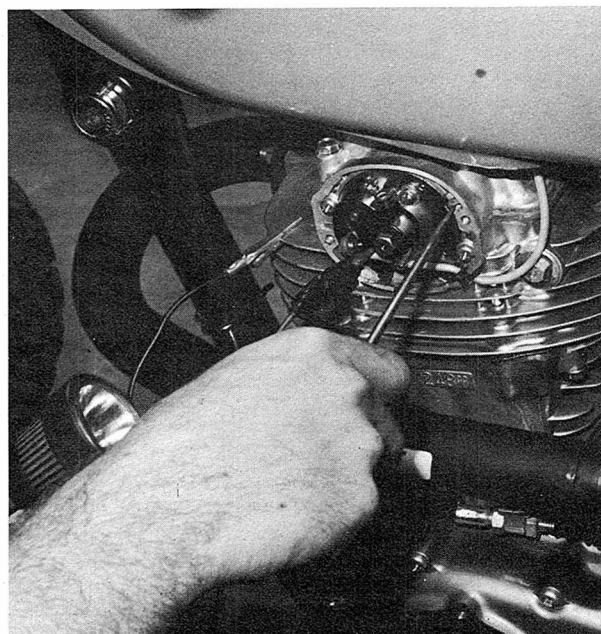
2. Before the next operation can be performed, the covers must be removed from the points and the generator. An impact driver is best for this operation, to minimize possible damage to screw heads.



3. The timing marks are located on the flywheel, with the index mark on the engine case. The "T" mark indicates top dead center, and the "F" (Fire) is an advance mark for ignition timing.



4. To set the point gap, turn the engine until the point block is resting on the highest point of the point cam. Loosen the hold-down screws and move the points until the proper gap is reached.



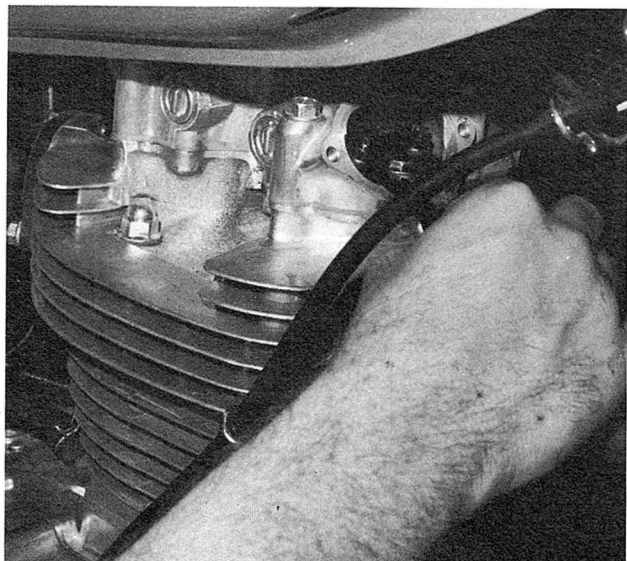
5. Set the ignition timing by rotating the entire point plate, until the points are just opening when the engine is on the "F" mark of the flywheel. Determine the point opening with a continuity tester or light.

engine case. Usually there will be more than one mark. One of the marks will represent the Top Dead Center, while the other will represent an advance mark for ignition timing. To set the ignition timing line-up the Firing mark with the piston coming up on a compression stroke. Hook up a continuity light or VOM to indicate the exact instant the points open, loosen the hold down screws for the ignition point base plate and rotate the plate until the points are just opening with

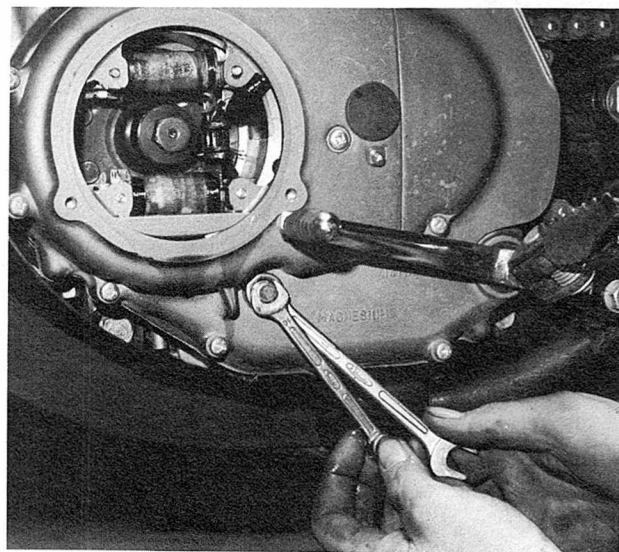
the timing mark lined up.

Next, we'll adjust the valves. For this, we will want to align the engine with the T.D.C. mark on the flywheel. On the Honda this is indicated with a "T". Again we will want the mark aligned with the piston up on a compression stroke. The simplest way to determine this is to place your finger over the spark plug hole as you're bringing the piston up, you should be able to feel the pressure build up as the piston comes up on a compression

stroke. To adjust the valves, remove the valve covers from the front (for the exhaust valves) and the rear (for the intake valves) of the head. To check the clearance insert a feeler gauge of the proper thickness between the adjuster screw and the valve stem. If the adjustment is too loose or too tight, loosen the lock nut and turn the adjuster screw until there is a light drag on the feeler gauge as it slides back and forth between the stem and screw.



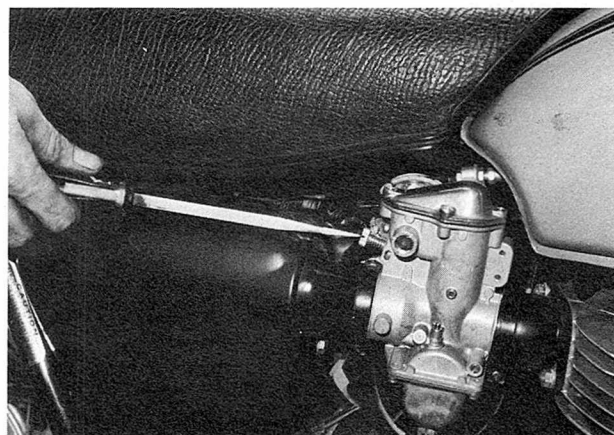
6. To adjust the valves, set the engine at T.D.C. of the compression stroke. Measure the clearance between the valve stem and the adjusting screw with a feeler gauge.



7. The cam chain tension is adjusted with the engine in the top dead center position. Loosen the lock nut and adjusting screw and the tension will adjust automatically. Retighten the screw and lock nut and you're finished.



8. Now you can examine the spark plug and either clean it or replace it. Set the gap between the electrode and the ground strap carefully and then install the plug back in the engine.



9. The final step in the tune-up is to set the carburetor idle adjustment. This must be done with the engine running, and warmed up to normal operating temperature.

Bikes with overhead valves will need to have the cam chain adjusted at each tune-up. Check the specific procedure for your own machine, but for the Honda it is a simple operation. Be sure the engine is at T.D.C., and then loosen the adjuster lock nut and adjuster screw. The cam chain will automatically adjust to the correct tension, and the tensioner screw and lock nut can then be tightened down again. With this done, you can replace all of the covers that have been re-

moved and move to the final stages of the tune-up.

Now, you can pick up that spark plug that we sat aside earlier, and examine it. If the electrodes appear to be in good shape clean the plug, if not replace it. Set the plug gap to the required figure (.024"-.028" on the Honda) and install it in the engine. With everything back together, the final step will be to adjust the carburetor.

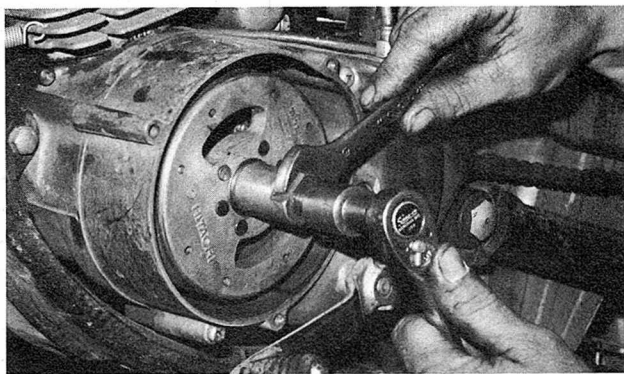
To adjust the carburetor, start the

engine and bring it up to operating temperature. The Honda adjustment requires turning the air screw until the highest idle speed is reached, and then readjusting the idle screw to fix the idle between 1000 and 1200 rpm. Resist the temptation to adjust more than the idle unless you are sure you know exactly what you are doing. With this adjustment finished, check to be sure that everything has been tightened down properly and you're ready for a test ride.

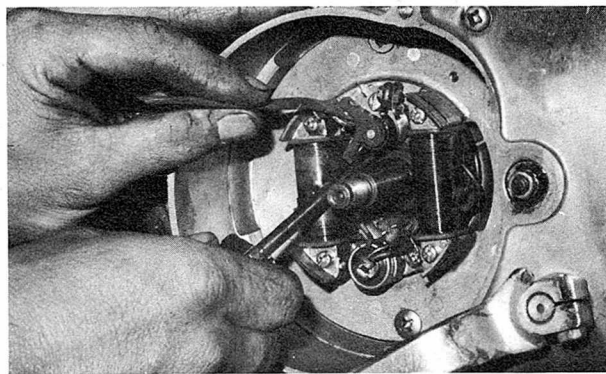
TWO-STROKE TUNE-UP



1. When carbon build-up becomes excessive the head should be removed and the carbon cleaned from the combustion chamber, as well as the top of the piston, and the exhaust port.



2. In order to clean the breaker points, the flywheel must be removed. A special flywheel puller is available from most motorcycle shops at a reasonable price, and is a good investment.



3. With the flywheel removed, the points can be checked and cleaned with a point file or emery board. When you have finished this step, be sure that the points are clean and free of oil.

TWO-STROKE TUNE-UP

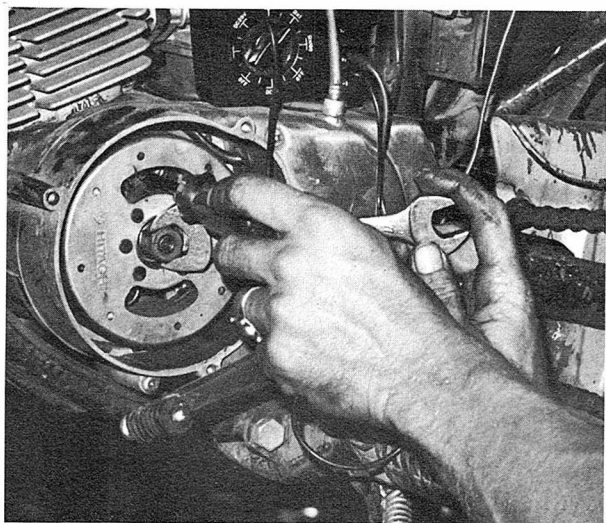
The steps that we will outline here for this two-stroke tune-up will represent a complete tune-up operation. Several of the steps which we will indicate as we go along will not be required on every tune-up, but only at periodic intervals as required. The two-stroke engine is generally easier to tune than the four-stroke, but will usually require more frequent attention.

As the result of the lubricating method used on most two-stroke en-

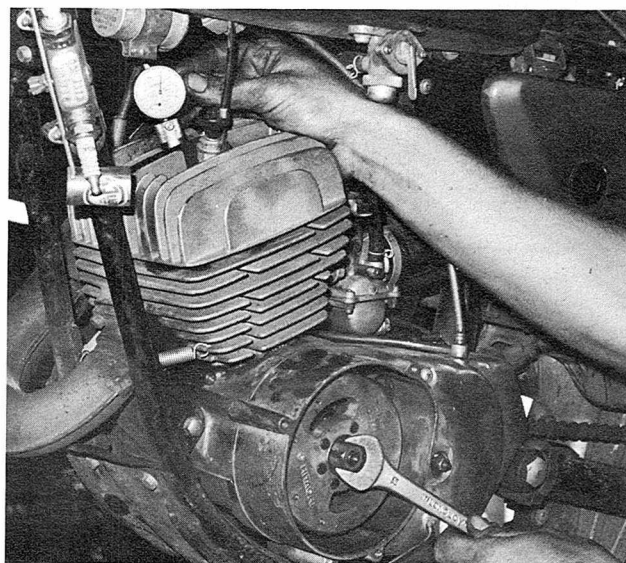
gines they have a tendency to build up carbon deposits in the combustion chamber. At periodic intervals the head should be removed and the carbon cleaned from the top of the combustion chamber and the top of the piston. Use a knife blade to carefully remove the bulk of the carbon from these surfaces, and finish the job with a fine grit wet-or-dry type sandpaper. While you're at it, use the same procedure to remove the carbon build-up from the exhaust port and the end

of the exhaust pipe. When you are finished, install a new head gasket and reinstall the head. It is best to use a torque wrench to tighten the head bolts to the proper specifications.

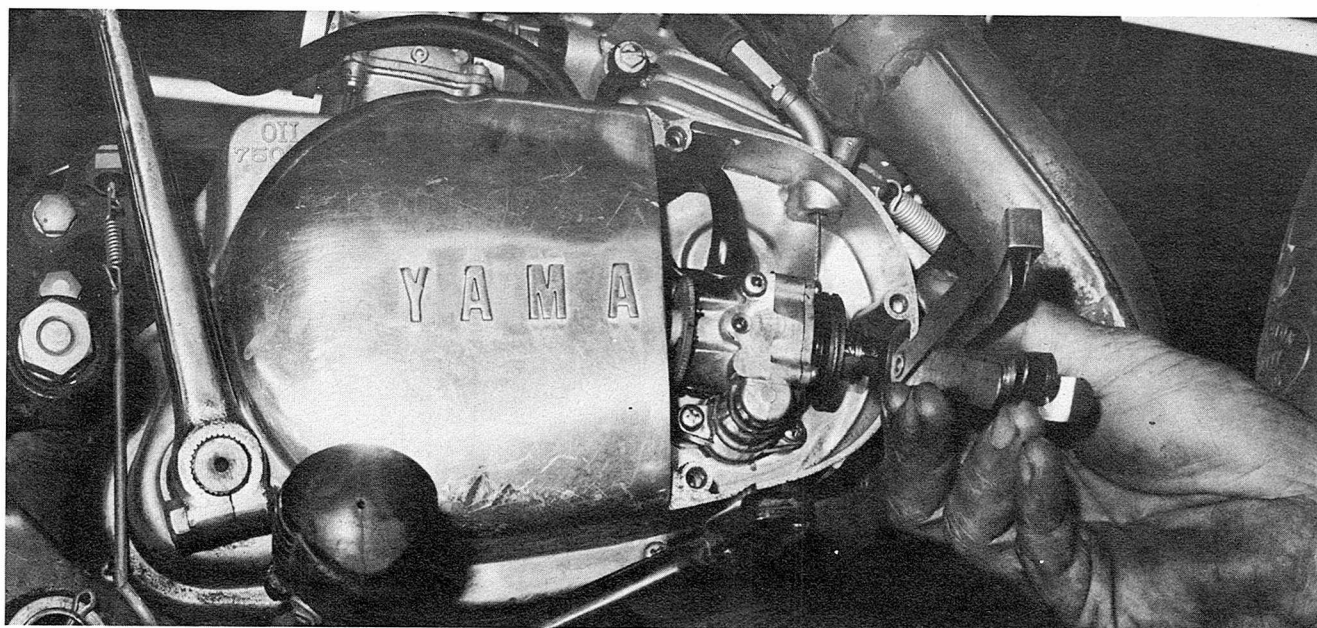
Next, remove the spark plug and set it aside for later. The ignition timing on your two-stroke, unless it is fitted with one of the new CDI systems, is controlled by the breaker points. Examine the points through the access hole in the flywheel to be



4. The ignition timing is set by adjusting the point gap so that the points open just as the piston reaches a prescribed point before top dead center. A dial indicator and continuity tester are used for the best accuracy.



5. Check the timing by rotating the engine toward T.D.C. and noting the exact point on the dial indicator at which the breaker point began to open.



6. On bikes with an oil injection system, it should be checked for the proper clearances and adjustment. On this Yamaha pump, end play is checked with a feeler gauge.

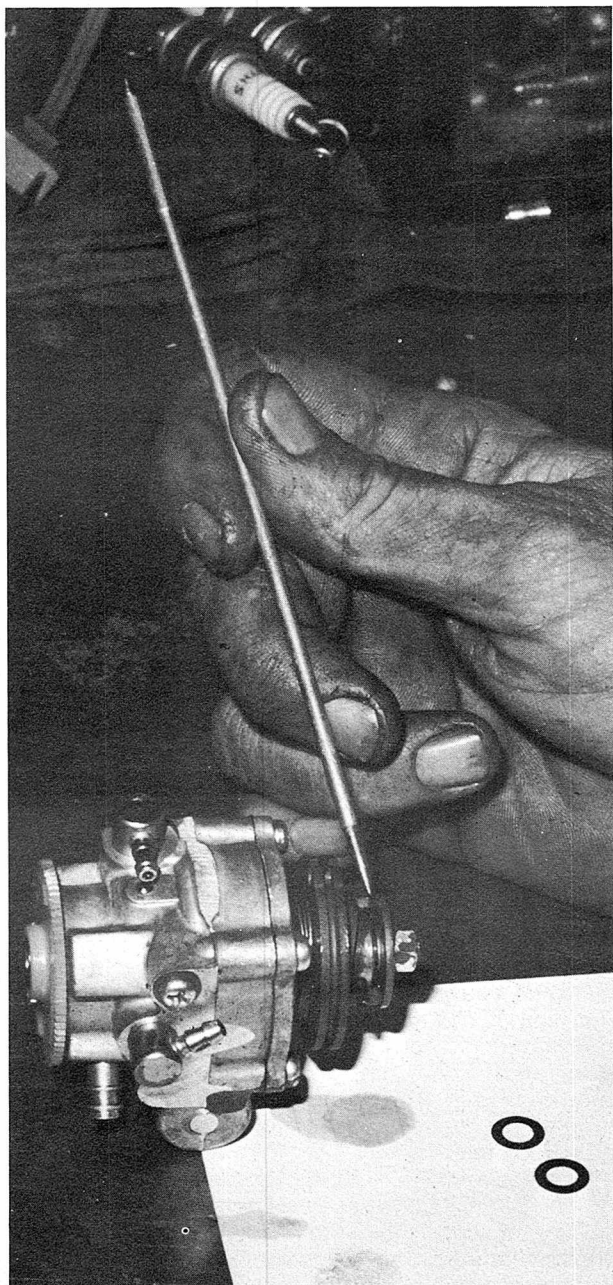
sure that their surfaces are clean and free from water and pitting. If the points need cleaning or replacing, the flywheel will have to be removed to gain access to them. Special flywheel pullers are available for a modest cost and will make this job much simpler. With the flywheel removed, clean the points with a point file or emery board. Be sure all of the filings are removed and the points are clean and free from oil when you're finished. After the points are in good shape the

flywheel can be replaced.

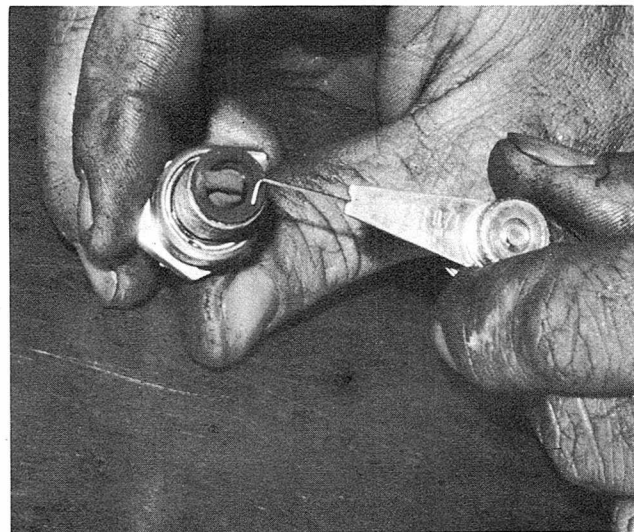
In general terms, the timing is set so that the points open at a specific point when the piston is a predetermined distance from the top of its stroke. The most accurate method for determining the exact location of the piston is the use of a dial indicator, which can be purchased from most motorcycle shops at a reasonable cost. Install the indicator in the spark plug hole and find top dead center for the piston. With the piston at T.D.C., set

the indicator at zero and then turn the engine backward until the piston drops to the distance specified for that particular model.

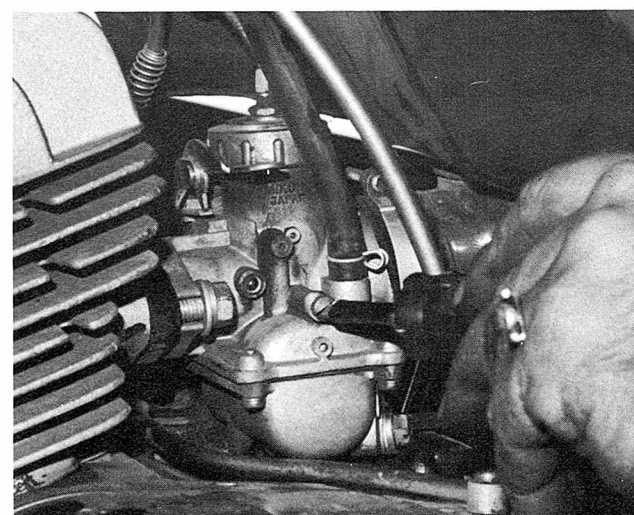
With the piston located in the proper position, change the point gap so that the points are just opening at this position. The opening of the points can best be determined with a continuity tester of light attached across the point circuit. After the points have been tightened, check the setting by rotating the engine and



7. On the Yamaha oil injection pump, excessive end play is corrected by installing additional shims. The shims are available from a Yamaha dealer, and important to insure correct operation.



8. At this point you can examine the spark plug and either clean it or replace it with a new one. The wire gauge shown here is the most accurate type for setting the plug gap correctly.



9. Carburetor adjustment is especially important on a two-stroke engine. Adjust idle setting with engine running. Don't tamper with other setting until you are sure what you are doing.

watching the indicator to determine the actual point at which the points open.

Many of the current two-strokes are equipped with some form of oil injection system. This system should be checked occasionally to be sure that it is operating correctly. Check in the appropriate shop manual for the exact procedure for your model. On the Yamaha Enduro that we used for this article, the injection pump throttle control shaft should be checked for

the proper end-play with a feeler gauge. If too much end-play is found the situation is corrected by installing shims that are available from Yamaha until the correct figure is established.

At this point we can turn our attention to the spark plug that we set aside earlier. Examine the end of the plug for excessive erosion of the electrodes and excessive carbon build-up inside the plug tip. If the plug appears to be in good condition it can be cleaned and re-used, otherwise it should be

replaced. Set the plug gap that is called for by your model, and re-install the plug in the head.

The final operation is to set the idle adjustment on the carburetor, and test ride the machine. It is particularly important, with a two-stroke, that you proceed with caution when dealing with the carburetor beyond a simple idle adjustment. Learn as much as you can about the carburetor and the engine before you attempt any major work on the carburetor.

HOW TO RIDE AN ENDURO

Curing the trail bike blues.

Suppose a fellow came to your door one evening and introduced himself as a poll taker, you know, one of those people who conduct national opinion polls to show that Donald Duck could not be certain of 62.7 percent of the Presidential vote, or that only 13.2 percent of the people in the country are in favor of post-marital sex. But before you can slam the door, this guy says he is studying trail bike riders. Since no opportunity to bench race is to be discarded lightly, you halt the door in mid-swing, invite the guy in, hand him a beer and prepare to inundate him with tales of the trail. Only he never gives you a chance. He's very businesslike and he wants to know in short order some facts about you, your family, your lifestyle, and the equipment you own. That's no fun at all, besides being an invasion of privacy, so you amuse yourself by telling a few lies and seeing to what extent this character can be put on.

Then, suddenly, there's a question that really makes you think. "What are your main gripes, or dissatisfactions with the sport?" The chances are pretty good that whoever you are and wherever you live, you'll come up with variations on five basic gripes: (1) You don't know where to ride, or how to find new trails. (2) You worry about the possibility of being hurt, especially of being seriously hurt, and having no help available. (3) Your level of skill does not seem to be rising very quickly. (4) Your companions' bikes are always breaking down so that you can never count on riding more than 20 miles in a day. (5) The one you really hate to admit, but, well, going out to the same places and riding the same trails each week, gets to seem a little pointless, even maybe boring.

If none of these problems bother you, then flip to the road tests. But if these problems are your problems, then why not ride a few enduros? As soon as you close your mouth and retrieve your eyeballs, we'll attempt to show you how enduros can be an answer to all of those problems!

To start with, an enduro is competition on several levels. On the surface you compete with the other contestants, but below that is competition with your friends and yourself. If you pick your enduros carefully (we'll tell you how in a few minutes), the competition will be sane. It won't be necessary to risk your life forty times a day to play the game; judgment, timekeeping ability, and machine

preparation are rewarded, while sheer bravado and senseless risk-taking are punished. This immediately takes care of two of the gripes, numbers 2 and 3. Taken seriously, any form of competition eliminates boredom. This is the reason even the most inane card games survive. It seems the second most pleasurable thing a person can do is beat someone else at something, regardless of what it is. The trick is to find something that provides not only the pleasure of beating someone, but other rewards as well. That's why we suggest enduros instead of Canasta.

Your skill level increases automatically as you ride regularly for longer periods and meet progressively stiffer challenges. The results sheets and the points standings give you a chart whereby you can measure your progress. Within a relatively short space of time you'll be able to measure your progress by the height and weight of your newest trophy.

What happens on the average trail ride? It usually turns into a race until the first guy breaks down, right? Most times it's a race that is far more seriously contested than any formal race because no one likes to be beat by his buddies. And under what conditions is that race! On informal trails, every bend might feature another rider or even a jeep coming from the opposite direction. The trail might be missed entirely, bulldozed out to build a road or a new tract of crummy houses. In the author's trail riding period, on one such race, one of the fellows clobbered his foot on a cement block the size of a beer case that was hidden in the weeds out in the middle of the desert. It was all that was left of an old building foundation, and he never even saw it. Six inches to the right and he'd have hit it with his front wheel at 50 mph. Right now, one trail rider's bike is hung at the 450-foot level of a 1000-foot mineshaft. Somehow the rider avoided going in with the bike or we'd have never heard about it . . .

Enduros do have a certain element of danger, especially the tougher, expert-only variety. But the danger element is of the broken collarbone, sprained ankle variety. The danger that trail riders often face is the death and dismemberment variety. The reason is simple: The trail you're going to ride has been checked beforehand for unusual danger, and marked accordingly. You will be warned if there is danger from traffic coming the other

way. There will be flagmen at road crossings. And most importantly, you won't be racing. The next time an enduro rider tells you he competes because it's safer than trail riding, don't laugh; it's true.

Don't discount the advantage of being able to get help quickly in an organized event, either. Someone always sweeps the course after a well run enduro to make sure that no one is lying near the trail with a broken leg, and generally ambulances or first aid teams are standing by. Where do you get help when you're trailing miles from civilization with a buddy who might not even be able to find his own way back to the truck? So much for gripe number 2.

The unwritten enduro code says that you stop and help if someone is hurt, but if they're just broken down, wish them luck on your way by. They either fix the problem or wait until after the run when the sweep crew or you come back to help. You'd be surprised how adept some of your friends will become at preparing their bikes after they sit next to a broken scooter for a few hours, or have to push it a couple of miles. Especially when you tell them that they missed the best part of the run. That rather effectively takes care of gripe number 4, unless you're the problem rider in the group. If that's the case, a crash course in bike maintenance is indicated.

The best reason for riding enduros I've saved for the last, and that is that you get to ride a different 70-200 mile trail every weekend! If there are a number of active enduro clubs in your area, it may be years before you have to ride the same trail again. Even if you wish to remain a trail rider, it's worth riding a few enduros just to expand your horizons. You'll find too that enduro clubs can get into places that an individual rider can't go. The author has ridden more than five thousand miles of trail this past year and rarely been over the same trail even twice. This isn't unusual for any active enduro rider. The average trail rider would be hard put to find 5000 miles of different trail in a lifetime of riding. The reason is simple! When you ride enduros there may be 50 or 100 riders out looking for trail for you each year. As a trail rider you have to find it all yourself.

You can find out about the enduros in your area by checking the posters in the local shops and by reading the calendar sections of your local cycle



newspaper. Don't plan to ride the first one that catches your eye. If you live close to any metropolitan area, you'll find a great variety of enduros. Length varies from 30 miles all the way up to 600 miles over three days. The terrain varies enormously. Read the poster carefully. If the poster says something like, "This is a toughie!" or "Be prepared to ride a *real* enduro!", believe it! On the other hand, if it says, "This is a timekeepers event" or "Recommended for beginners," you can be relatively sure that you won't encounter any overwhelming obstacles. Pick your first events with great care. There's nothing more disheartening than failing to finish several runs in a row.

While you're reading the poster, find out just what is required to enter and what is required to ride. Often you must belong to an organization, such as the AMA or the New England Trail Riders Association. Some enduros are restricted to amateurs and experts. Novice entries are not accepted. Others are novice-only events.

The poster will also tell you what mechanical requirements must be met. If the organizers bother to put it on the poster, they usually mean it, and you won't be allowed to ride if your bike isn't properly fitted. Most enduros require a bike to have a silencer and there are sound tests at some. If the enduro is run in the forest, you will in addition be required to have a "Forest Service Approved" spark arrestor and there may well be a Forest Ranger at the start to check. No Sparkee, no ridee! If mufflers or spark arrestors are required in your area, it is best to have them welded in place. After every run the organizers find several silencers and spark arrestors that the riders lost because they relied on hose clamps or wire to hold them in place.

The most stringent requirement that you're likely to be asked to meet is "street legal." Generally, if this is a requirement, it's meant to protect you; the club is planning to use highways or county roads in the run and there may be police patrolling the area. The police sometimes take a rather dim view of motorcycles under the best of conditions, and a stripped bike with no plates, lights, or other refinements is sure to merit a ticket, even if the rider isn't trying to make up time at 80-plus. Most of the time you can get away with a small headlight, taillight, a cheap bulb-type horn, a small bicycle-type mirror and a license plate, but check to make sure *before* you enter the run.

Enduro riders are lucky in one respect: Almost any reasonable trail bike is suitable for enduros. Enduro bikes should have a good, wide-ratio gear

box and a nice tractable engine. But most important, they must be dead reliable. The make of the bike is not important. Two years ago, the AMA's Grand National Enduro champ rode a 350 Honda. Bob Steffan, who wins regularly on the West Coast, rode a 350 Harley Sprint for two years, then switched to a 350 Bultaco. He won on both bikes, dissimilar as they are. Dave Mungenast in the St. Louis area has done well on both a Husky 400 and a Honda 250. In enduros, it is the rider and the machine preparation that count, not the brand. The only bikes to really shy away from are those with a reputation for being unreliable or temperamental.

Space does not permit us to go into the subject of bike preparation at any length, but there are three or four areas that are consistently overlooked by beginners. First is waterproofing. Every enduro finds half a dozen bikes drowned out at the first water crossing. While we can't tell you just how to waterproof every susceptible item on the bike, we can tell you how to check to see if you've done it properly. Take the bike to a 25-cent car wash, preferably when it's quite chilly, and soak it good. Then try to start it. If it doesn't start easily, work on it until it passes this test. Then set it up at a fast idle and soak every susceptible item while the engine is running. If it drowns, more work. Spray water at the air cleaner at a height equal to the carburetor; then disassemble the carb and the air cleaner and see if any water got in. If it did, modify the air cleaner until it passes this test.

A good skid plate is a must. It should come out on both sides sufficiently to offer some protection to the shift and brake arms. Few factory skid plates are adequate.

Next to waterproofing, the area that seems to offer the most trouble is the chain, particularly when the going is muddy. A fully enclosed chain such as is found on the Bultaco Matador is the best answer, but failing that, one should at least have some sort of guard to keep the rear wheel from packing the chain with mud. A chain guide is also absolutely essential.

The air cleaner, besides being waterproof, must be absolutely dust-proof. Dust and grit that makes its way through the air cleaner will not only ruin an engine in short order, but will also cause innumerable problems on the trail. If you experience spark plug problems, nine times out of ten the fault will lay with a poor air cleaner.

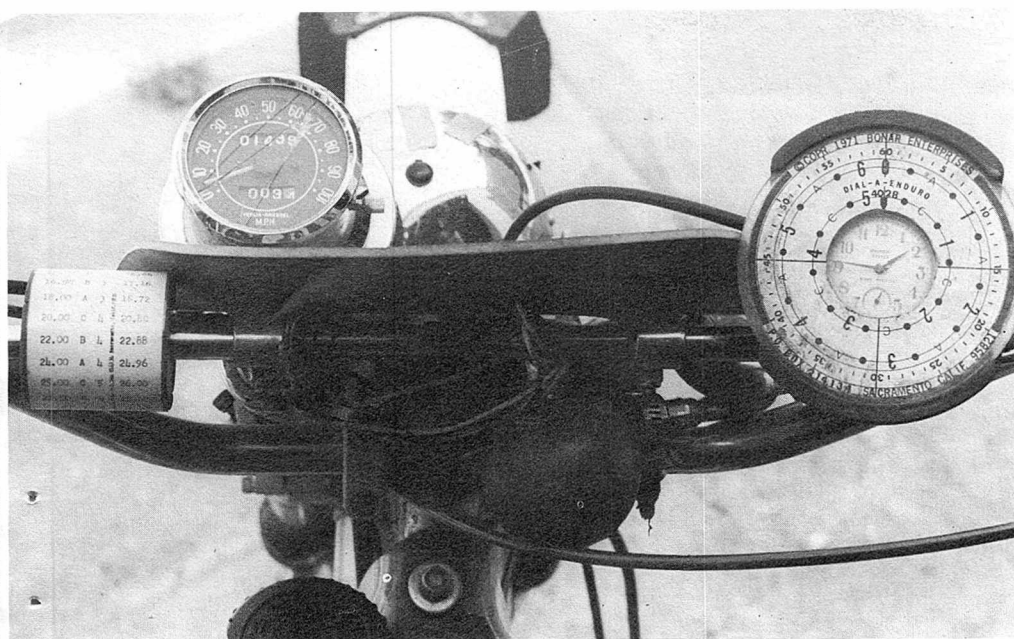
Don't neglect your body in preparing to ride enduros. An enduro is an athletic contest, and it is just as important for you to be in shape and properly garbed as it is for the football

player. It is actually more important for the beginner to be in shape than it is for the expert for the simple reason that the expert has learned how to do things the easy way. You, as the beginner, will do many things the hard way and consequently will expend much more energy than the more experienced rider. One sobering thought: An exhausted rider is a most likely candidate for an ambulance ride.

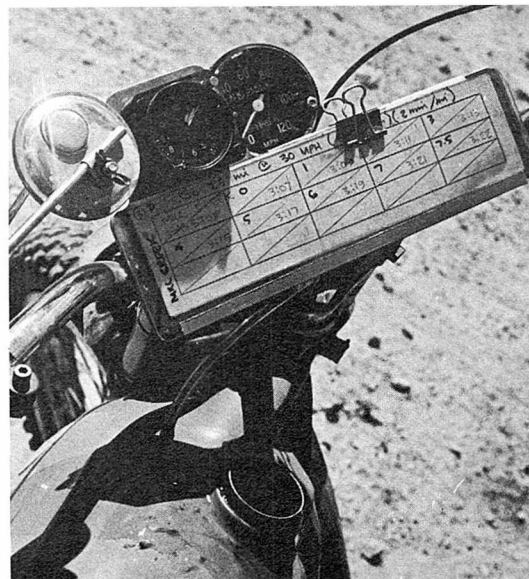
Your riding gear will depend largely of course on the time of year, the climate, and the weather. But do yourself a big favor if you live anywhere except in the southwest: Buy a Barbour suit. A Barbour suit or one of its copies is mandatory whenever it's either cold or wet, and enduros have a way of being both a good portion of the time. We can't recommend this strongly enough. Nothing in this world can make a rider feel more miserable than being cold and soaked through to the skin, and believe me, nothing else works.

Enduros are run under many different systems of rules, and there is no substitute for studying the rules that are used in your particular area. Some things, though, are basic. All enduros require you to "keep time." This means that you must ride at some predetermined average speed. It may be anything from 4 mph to 36 mph, depending on how tough the organizers want to make it, and what the conditions are. You will always know beforehand what the average is to be for a particular section, but how much beforehand varies quite a bit. Some clubs will send you a schedule with your number in the mail; some announce the schedule at the riders' meeting; still others post it on white cards at each speed change. The last, of course, is the hardest to deal with because you must figure out how to keep that particular schedule right on the spot.

A watch and an odometer are the basic instruments needed for keeping time, and in some runs they will be quite sufficient. If the schedule speed is a straight 24 mph, and you start at 8:10, you simply go one mile every 2½ minutes. You look at your watch at 8:30. You've been riding 20 minutes so you should have covered 8 miles. Every one-tenth of a mile should take you 15 seconds. So at 9:01 your speedometer should read 20.4 miles. If the enduros in your area are commonly run at one speed average all the way through, memorize the combinations that you need. Twelve mph is one mile in 5 minutes; 18 mph is 3 miles in 10 minutes, 3 minutes and 20 seconds per mile, and so on. It's just simple multiplication and division, no magic.



This is the Dial-A-Enduro set-up on the author's bike. Note that on the dial on the unit at right the last number on the two scales does not come back to zero. This is because each unit is matched to the rider's own speedometer to nullify speedometer errors. The drum at left tells you that at 24 mph you should be using the "A" scale, multiplying by 4, and that at the end of one hour your speedometer should read 24.96 because of the error in the speedometer.



All kinds of systems are used for keeping time. This rider has made out cards showing the minute in which his speedometer should pass each mile. This is fairly effective but requires a lot of preparation, and the sheets must be changed every nine or ten miles.



The usual method of marking an enduro trail is with arrows such as these, but there are variations to suit local conditions. Where Forest Service prohibitions exist, the arrows are tacked to stakes and stuck in the ground. In the desert, extensive use is made of surveyor's ribbon and lime for marking.



If you fail to waterproof your bike, it will drown out. Should the engine fill up with water, this is the procedure for restarting. Turn the bike over, remove the spark plug, engage the gears, and using the rear wheel to turn over the engine, pump the water out.

The organizers can and frequently do make things quite a bit more complicated by throwing several "speed changes" (a change of schedule speed from, say, 12 to 18 mph) at you, using oddball speeds (like 17 mph) and giving you no advance warning. To handle these complications there are many gadgets available ranging from circular slide rules to full-fledged digital read-out computers. As a general rule the more accurate and comprehensive the device, the more manipulating and mental effort it takes to use it. You will find that a device that seems to operate fine in your kitchen you can't use at all on the trail because you're tired and your mind doesn't function as well. Usually you will have to make some compromise between absolute accuracy and convenience.

The best device that the author has found to date is a gismo with a name that is a grammatical horror, Dial-A-Enduro. Actually, the device consists of two units, a clock-holder of a spongy, shock absorbent material which has a plastic disk with scales to hold the clock in place, and a drum which incorporates the needed multiplier information. Nothing needs to be adjusted while riding and only one adjustment is needed at each speed change. The clock need never be touched after it is initially set on key time. These are advantages that you can only appreciate after you have used some other devices.

To use this particular device, when you arrive at a speed change, you set the index of the dial opposite the key-time minute for that speed change. If, for instance, you are changing to a speed average of 12 mph and key time is 11:19, you would set the "0" or index of the plastic disk opposite 19 minutes on the clock. You would also note from the drum the multiplier for this speed average, in this case "2". From then on, throughout that section, whenever you want to check your time, you note the number that the minute hand of the clock points to, multiply that number by 2 and it should correspond to your speedometer reading. Since the multipliers are only 1, 2, 3, and 4, mental capacities are not taxed very heavily, and the unit is in practice very easy to use. For more information on this device, contact RESA Distributing Co., P.O. Box 7332, Sacramento, California 95826.

So far we have not said much about the actual riding in an enduro for one simple reason: You don't learn to ride a motorcycle by reading any more than you learn to play a piano by reading. If you are lucky and there are beginner enduros in your area, you will be able to start learning to keep

time right away and maybe even win some gold, but more likely the enduros will be tailored for better riders and you will have to go through an apprenticeship period, learning to ride well enough to keep up the schedule.

There's no secret to learning to ride well, just practice and pay attention to what you're doing. Find out what kinds of terrain give you difficulty. Find some similar terrain close to home and practice. Practice going up and down hills, making turns on hills, jumping off small embankments, jumping logs, riding in sand, mud, and even snow. Try to get to the point where you stand automatically when something unusual comes along. Learn to loft the front wheel so you can go over an obstacle without coming to a dead stop. Practice sliding on fireroads, but do it first on an empty lot or baseball diamond so you don't get run over when you overdo it.

power for greater effect on difficult surfaces.

Enduro riding is a fairly rough sport. When you first start riding you will be much slower than most of the other riders, so when you hear a rider behind you, get out of the way! This is not just a matter of courtesy; there are plenty of riders who will become exasperated with you and pass regardless of the width of the trail. Since two motorcycles cannot occupy the same space at the same time, one will be shunted and you know which one. The guy who is passing has all the advantage. If you've been holding up a whole line for an interminable period, the first guy might knock you down and the rest of the line will use various parts of your bike and bod for traction. Who needs it? Move over and you'll get a friendly wave of thanks instead.

Every new rider tends to ride as fast



One of the benefits of riding enduros is the occasional privilege of riding trails that are not open to other riders, such as this one which wound along a beautiful creek in the Angeles Forest in Southern California.

The best practice will be in the enduro itself, if you continually think about what you're doing and remember your mistakes. Every time you fall down or get behind schedule, you did something wrong. Figure out just what it was so that you don't do the same thing the next time. Although English trials is a sport in its own right, you might consider riding some trials for the help it will give you in mastering enduros. It's always easy to tell a trials rider in an enduro: When everyone else is stuck in some hopeless situation, the guy who goes motoring by like he was on asphalt is the trials rider. Riding trials teaches you how to shift your body weight for maximum effect and how to control your throttle and use surges of

as he possibly can because he's behind almost from the minute he starts. Don't do it. Keep some in reserve. Besides the very real possibility of getting hurt, it's strategically poor. Every time you fall down you can count on losing at least 5 minutes. Slowing down by 5 percent would cost less time in a four-hour run than two falls, and it's a lot easier on the body. Enjoy the scenery a little bit. After all, that's one of the reasons you want to ride isn't it? ●



A narrow off-camber trail is one of the most difficult obstacles for novice riders. Note that these riders all have their bikes tilted into the hill and as soon as they apply throttle, the rear wheel slides out.



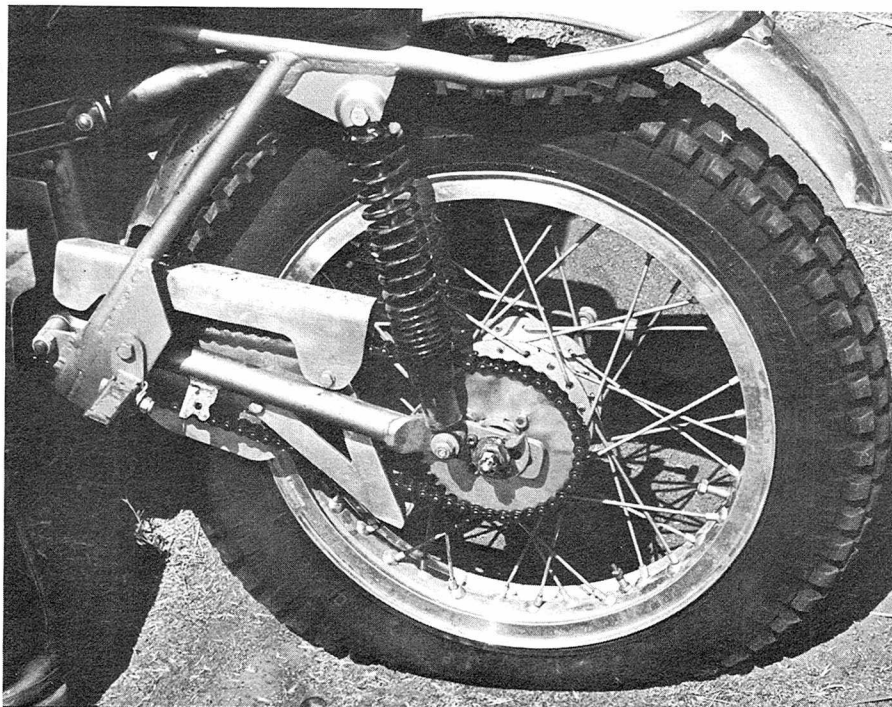
Sometimes two riders will team up temporarily to get through a difficult spot. Note the large skid plate that has been added and the rocks which make it necessary.



Learn to go up difficult hills standing on the pegs and applying the throttle with discretion. In situations like this one, full throttle and lots of power would result in the rear wheel digging a hole and burying itself.



Enduro riders must be prepared to encounter rocks of many varieties. The only way to successfully ride rock is up on the pegs, trials style.



SO YOU'VE GOT A FLAT TIRE!

*It can happen to anyone, even you.
Here's what to do and how to do it.*

The trail is a good one. Trees become a blur as all your concentration is required to keep the motorcycle upright, and in a straight line, on the extremely muddy going. Oops! Nearly went down there, but a hefty dab with a boot saves the day, followed by another and yet again. The bike feels as if it's hinged in the middle. Why does it seem impossible to keep it in a straight line? Gotta slow down and look, perhaps something has come adrift, or maybe the frame is broken. Oh no! I've got a flat!!!

This situation may or may not have happened to you. Consider the abuse that motorcycle tires and tubes are subjected to, they survive remarkably well. On a dirt bike, rear tires are run at quite low pressure, and everyone has seen photographs of the concus-

sion that occurs when a bike lands on the rear wheel, after just a moderate jump. The sight of a flat rear tire, in most cases, is enough to send the average motorcyclist into convulsions. Take heart, Mr. Average Motorcyclist, the following photographic procedure won't make you an instant expert at removing, and replacing tires, but with a little practice and know how, it should help eliminate that sinking feeling you get at the sight of a rim resting on the tire.

As in any repair, there is a hard way, and an easy way of getting the job done. The thought of repairing the inner tube is not what bothers most motorcyclists, it's getting the tire back on without pinching the tube in the process. The easiest way of pinching the inner tube is indiscriminate use of

tire irons. An old ISDT competitor we know has an occasional party at his house, and always organizes a tire changing competition. In his many years competing in six day trails, he has removed and replaced many rear tires as part of the competition. His time for the complete exercise is within, or around the four minute mark. The annoying part of his party piece, is that he uses tablespoons to do the job. The spoons very rarely ever finish up bent, which proves that experience and know how play a major part.

When repairing flat tires, the right tools play an important part. At least two tire irons are required. The ends must be smooth and well radiused. Anything that resembles a screwdriver, is not suitable for the job in hand. The advantage of the small irons is that they are small enough to be carried on your person or machine. Hyland M.V., Box 39393, Los Angeles, 90039, Cal., will supply you with a pair of these irons for \$1.50. The repair kit came from Webco, Inc., and is excellent value at \$5.95. As well as containing numerous patches, and enough rubber cement for each application, in tiny plastic pellets, two small CO₂ bottles are also included. When screwed onto the re-installed tube with adaptor supplied, the bottle refills the inner tube in seconds.

The major points to remember when removing the tire are: Start to remove the tire diametrically opposite the valve stem, if the tire has no security lock. A sufficient amount of the tire bead must be pushed in the well of the rim, to enable a tire iron to get a reasonable 'bite' for removal. When taking the second 'bite' with the other tire iron, keep the distance between the tire irons to a minimum, no more than 5 or 6 inches at the most.

If the wheel has a security lock opposite the valve stem, loosen the security lock, and push up into the tire, this will enable the tire bead to be pushed down into the well in the area of the security lock. Start to remove the tire in either area at 90° degrees to the security lock.

When replacing the tire the major points to remember are: lightly inflate the inner tube before replacing, this will help eliminate pinching with a tire iron. Start replacing the tire at the valve stem. Pull the valve stem down, and lightly tighten the knurled nut on the valve stem. The nut will help hold the tire bead in place while you gradually inch the tire over the rest of the rim. This can be achieved quite successfully with both hands and feet. The last six inches of the tire are the hardest to put over the rim, but by forcing the tire deep into the well around its total circumference, the tire

can be popped over quite easily. Do not finish at the security lock, because you won't have enough hands to force the tire over the rim and push the security bolt up into the tire.

The series of photographs show two ways of repairing flats. The first is clinical approach, complete removal of the wheel at home, with the sprocket carrier and brake plate assembly removed. One point to remember, if your bike doesn't have a removable sprocket carrier, start to remove the tire on the opposite side to the sprocket. Blood and rubber cement don't mix. The second way is the trail side method. This does not necessitate removal of the wheel, but only of one side of the tire. The only problem with this method is getting enough of the tire into the well of the rim, so that the bead can be removed, and replaced.

If the thought of repairing flats upsets you, why not strike while the iron is hot. Studying the accompanying photographs, then go out to your garage and remove your rear tire half a dozen times. You'll be surprised that

after the second, or third time how easier it becomes. By then you will have become more knowledgeable of where to push and how much force to apply.

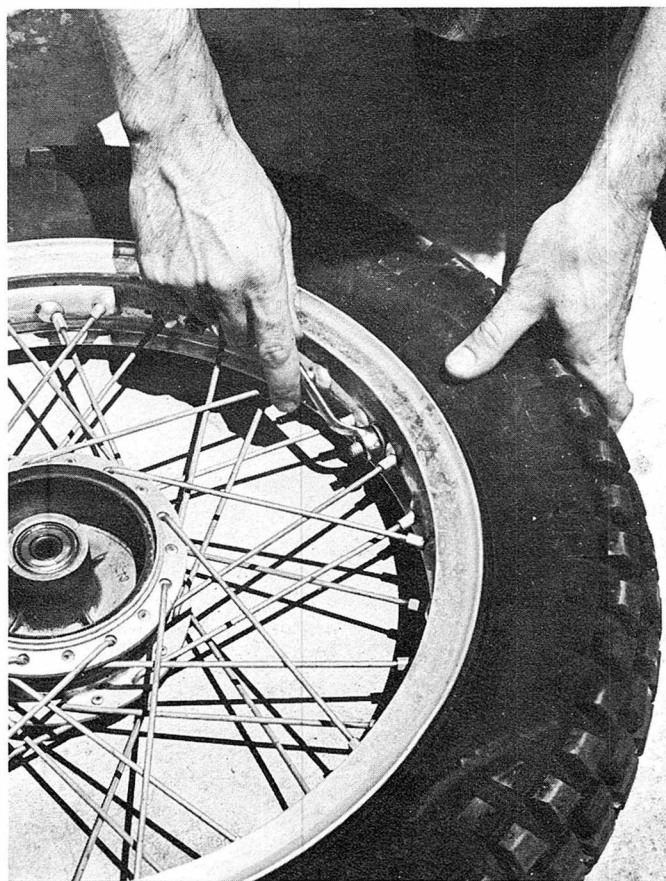
Who knows, but sometime soon you may stop on a trail and offer

These are the basic tools you will need. Small enough to fit into any pocket or tool compartment, they should be in every trail riders tool kit.

assistance, to a dejected looking guy who is looking at his flat rear tire. ●



The Backyard Approach



1. Remove security lock nut, and knurled nut from valve stem. By pushing up into the tire, ensure that both are in no way trapped, but do not push threaded portions out of their respective holes.



2. By using hands and/or feet, break the bead on both sides of the rim.



3. With both knees forcing the bead into the well, take a small 'bite' with both tire irons, and force tire over rim.



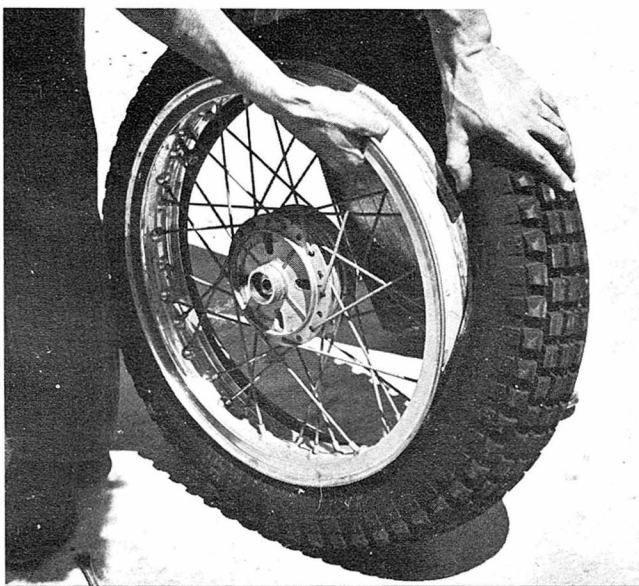
4. With one tire iron in the 'locked' position, move around the rim in small increments.



5. When you are halfway around the wheel, the tire bead will slip over the rim with virtually no resistance.



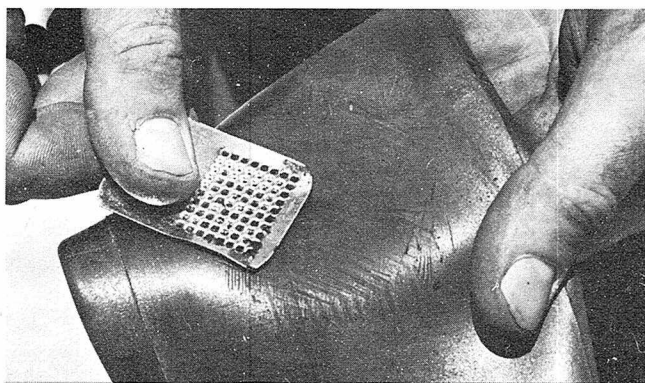
6. Remove the innertube at valve stem, and gradually work around the rim.



7. Force the bead still remaining in the well over the rim, and remove the tire.



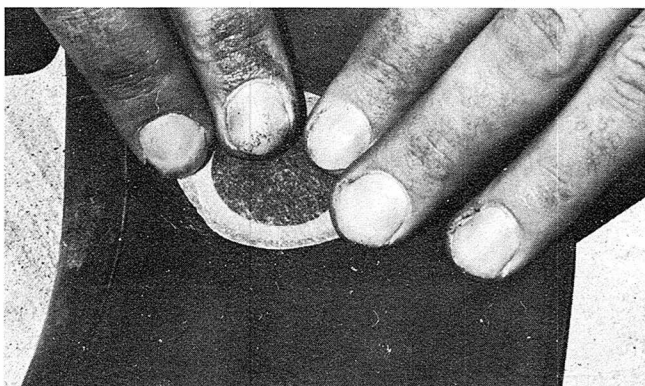
8. Check the tire for a nail and remove. If the hole is large, use the special patch provided in the repair kit. This patch is only to be used on the inside of the tire.



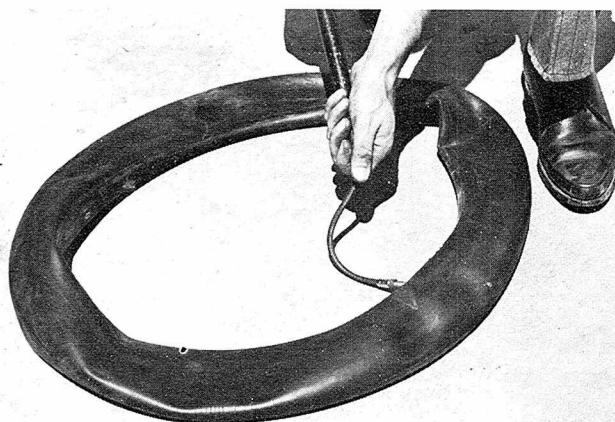
9. Having established the location of the hole in the inner tube, use the buffer provided to rough up the area. This is essential for a successful repair.



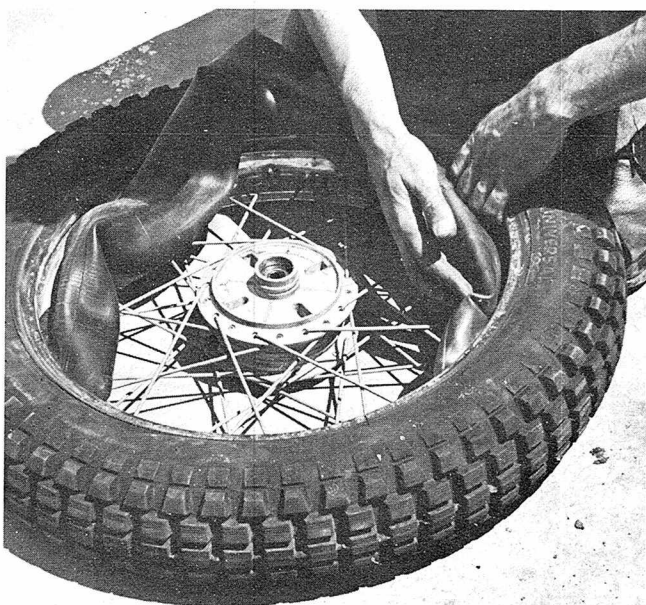
10. Spread a pellet of rubber cement, over an area slightly larger than the diameter of the chosen patch and allow to dry.



11. Remove the backing from the patch and firmly press down. Remove protective paper by bending patch double when dry!



12. Check repair upon completion. A cycle inflator is slow, but saves the day when no air line is available.

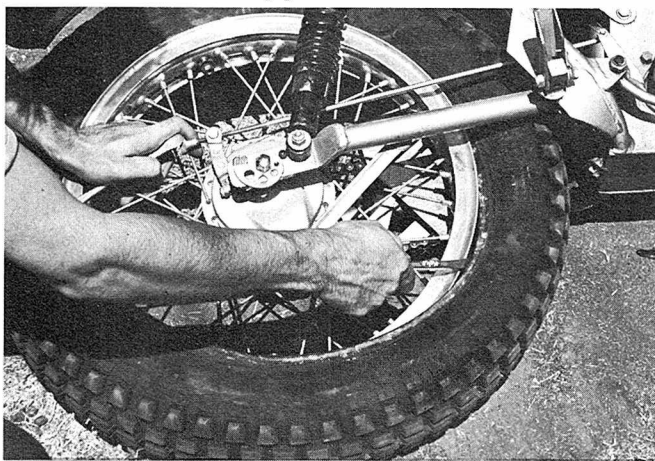


13. Having replaced the tire on the rim, lightly inflate the tube. Starting with the valve stem, feed the tube into the tire.

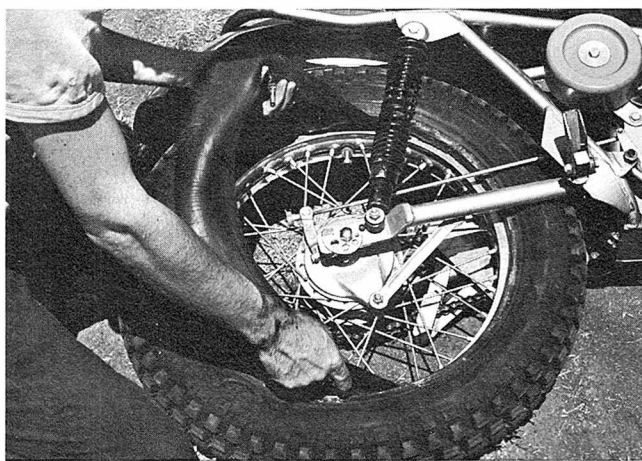


14. Starting at the valve stem, most of the tire can be forced over the rim with hands and feet. Push the security lock up into the tire, when working in this area. Ensure that the tire is well down into the well, and the last six inches will pop over the rim. Check to make sure that the security lock moves up and down. Inflate tube, tighten security lock.

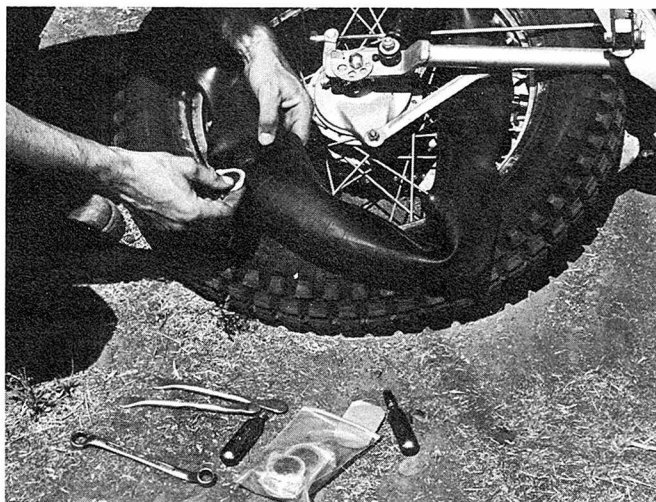
The Trail-Side Approach



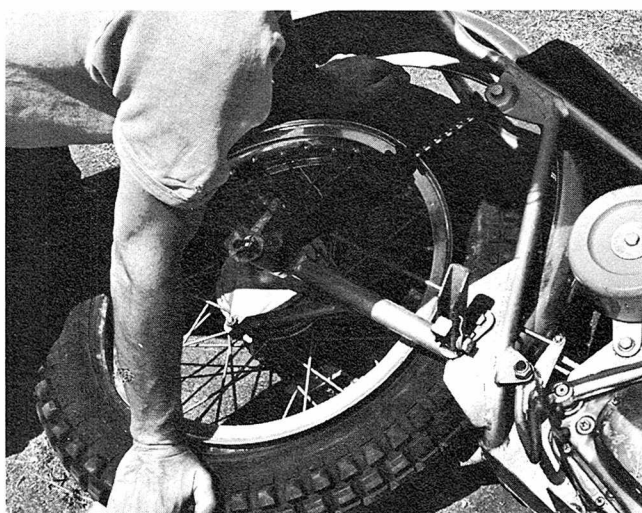
1. Loosen security lock, remove valve stem and proceed as before to remove one side of the tire. It will be necessary to employ both feet and knees to push the tire bead into the well when taking the first 'bite' with the tire irons.



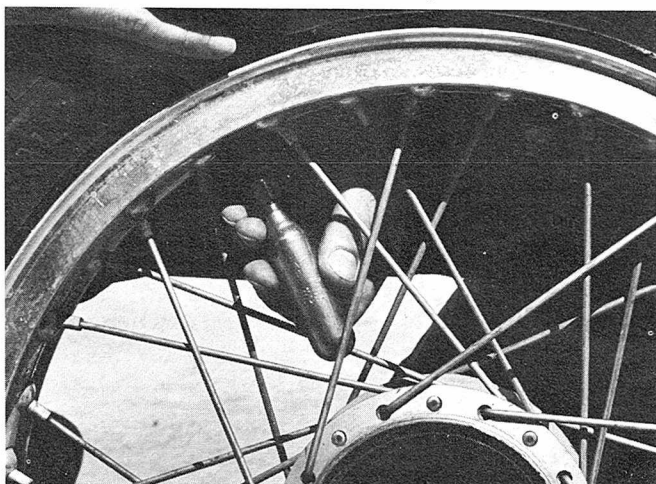
2. Remove the inner tube at the valve stem, and gradually work around rim.



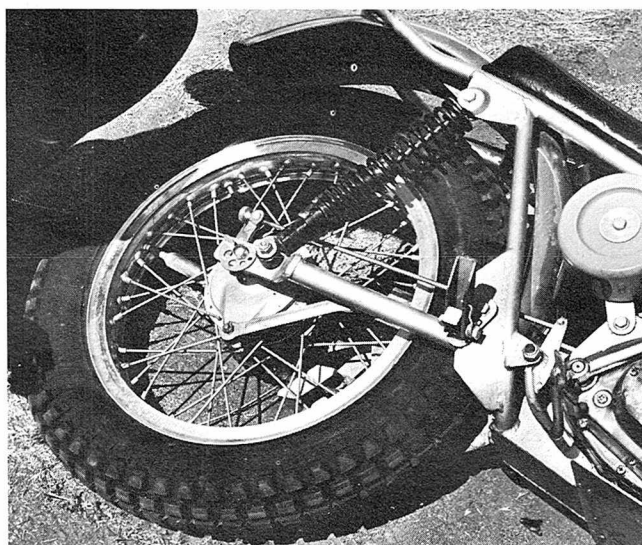
3. Inflate tube, if hole is not immediately noticeable. Running the inflated tube underneath your nose will usually help locate an unobtrusive hole. Repair as before and remove nail or obstruction from tire.



4. Replace the lightly inflated tube, and replace the tire, employing hands, knees and feet to their best advantage in the space available.



5. Screw the adaptor provided onto the valve stem. Screw the CO₂ bottle into the adaptor until you hear the air going into the tire.



6. Because of the pressure in the CO₂ bottle, frost will form around the adaptor and bottle. The bottle contains enough air for emergencies and should be replaced as soon as possible.

THE TRAIL RIDER'S TOOL KIT

Having the right tool for the job can save a lot of trouble. Careful thought in the selection of tools for both your trail riding kit and your garage will pay big dividends at repair time.

There always seems to be a few riders around that will insist that if you prepare your trail bike carefully and care for it properly you shouldn't have problems out on the trail and that carrying tools and other odds and ends on the trail is simply carrying excess baggage. There are few riders, however, that adhere to this belief for any great period of time that do not live to regret it. No matter how well you prepare your bike and care for it there always seems to be something that is lurking in the shadows waiting for an inopportune time to cause you trouble.

What tools should you carry on your trail bike? What kind of trouble should you be prepared to handle? If your trail bike is already equipped with a tool kit from the factory as many of the popular models are, is this kit adequate for your particular needs?

There are many questions in regard to tool kits, that come up with a good deal of regularity and we will attempt to examine the basis for answers to these as well as others regarding the best tools for the job.

Each individual's tool needs are different, and at least to some degree each individual must decide which tool he needs which he doesn't. In order to accurately assess your tool needs, you must first have some idea about what problems you can reasonably expect to face, both on the trail and in the shop. With careful thought you can keep your tool kit to a manageable size and still have the secu-



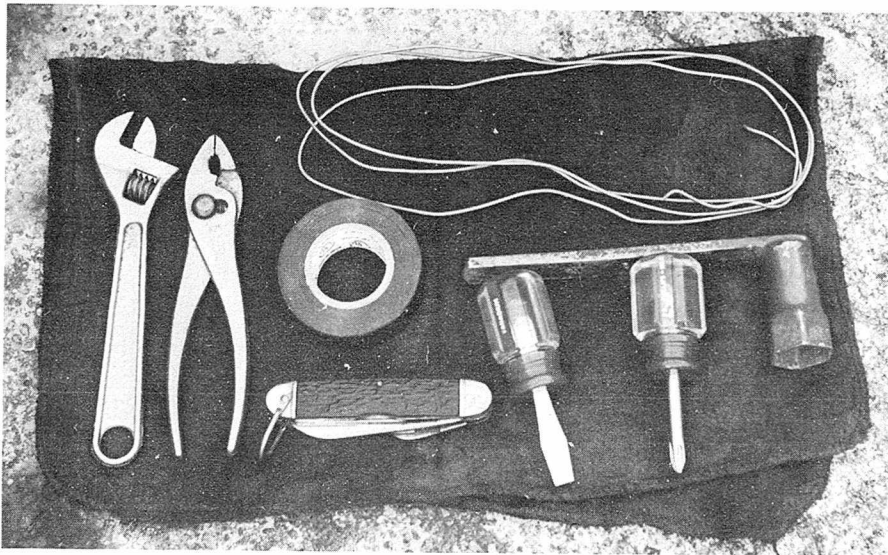
The basic tool kit that comes with many trail bikes offers a wide variety of tools, but can still usually benefit from a few additional special items.

urity that you won't get caught unprepared.

Most trail bikes come with some form of complete tool kit. Though the quality of the tools may at times be subject to question, the completeness of the set rarely is, at least with regard to normal repairs. There is usually a tool included in the kit that will remove just about any nut, bolt, or screw on the machine. All trail-side

repairs, however, don't follow the standard pattern of repair work. Often the repair job involves more than just removing nuts bolts and screws, and even having your factory-fresh, plastic bagged tool kit may not leave you in a position to correct a problem. What do you need in your tool kit? The answer to this question is found in another question; what are some of the most common problems that I am likely to face, and how do I fix them.

One of the most common ailments that can cause trouble for trail riders, short of running out of gas, is fouled spark plugs. Especially in the case of a two-stroke the chance of fouling a



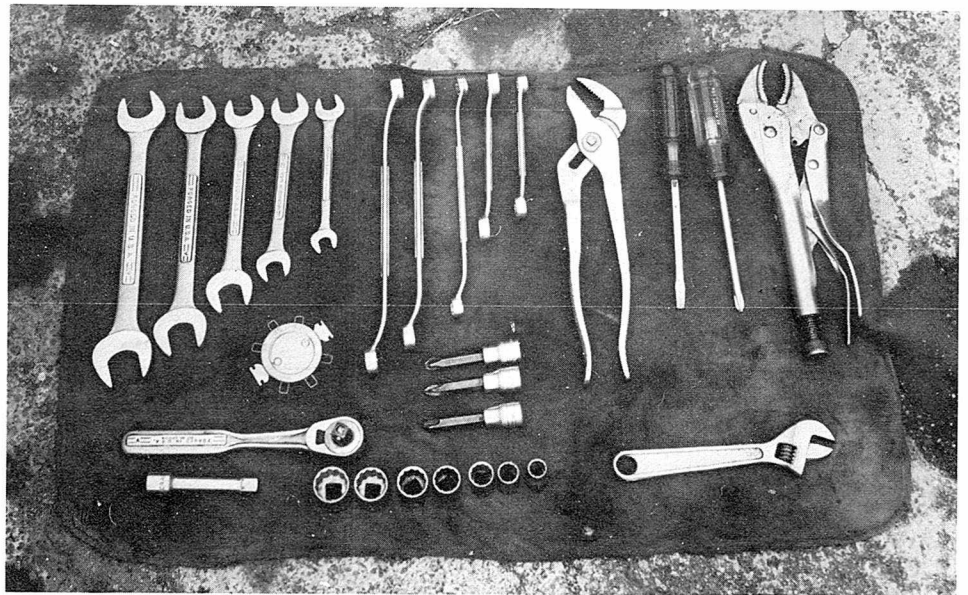
With a little careful thought a simple, easy to carry tool kit can be put together that will adequately serve your needs for trail-side repair.

spark plug is quite high, even with good preparation.

Preparation is a term that seems to keep creeping into the discussion, and with good reason. You can't possibly carry enough tools to repair anything that might go wrong with your machine. Even if you could, most riders hit the trail to go riding, not lay in the dirt and work on their machines. Most potential problems should be eliminated by careful inspection, maintenance, and tuning, before you venture out into the wilderness.

In short, periodic preparation for trail riding is essential in order to keep possible trouble to a minimum and keep the size of your tool box manageable. Our purpose here, however, is not to discuss techniques of maintenance and preparation, so for the purposes of this discussion we will assume that our machine has been tuned properly and checked completely, to minimize the chances of having some major component come loose and fall off or drag in the dirt. There are enough unavoidable problems in trail riding without leaving ourselves open for trouble of this sort.

A little bit more water in a stream or puddle than you expected can be one source of trouble for the trail rider, often in spite of good preparation. Although the electrical system can usually be protected reasonably well from water, there is very little that you can do to stop water from entering the air intake system should it get the chance. When this happens, there is a good chance that a bit of dismantling will be required before you can be on your way again. The proper wrenches as well as a protected dry

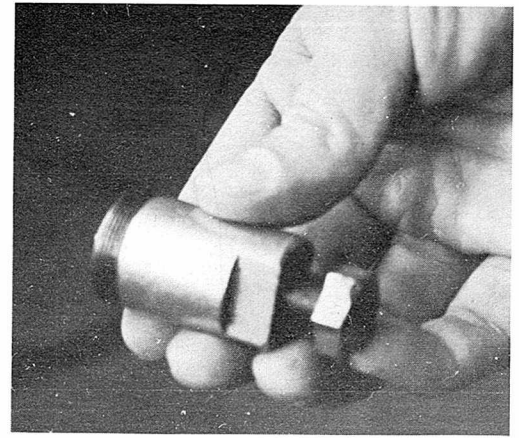


If chosen wisely, a few basic tools will easily get the job done in your home workshop. Start with basic wrenches and add specialized tools as the need arises.

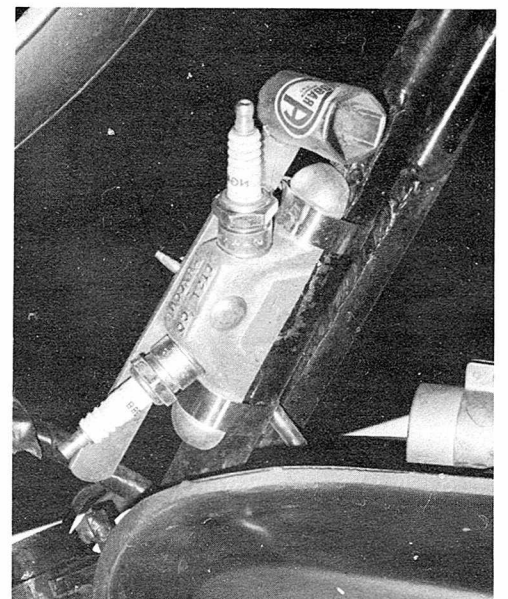
rag can be a real blessing at this point.

A flat tire is another problem that is hard to prevent by any method short of staying home. Even though you have ridden hundreds or thousands of miles without so much as a slow leak, an unexpected flat may be as close as the next revolution of your wheel. The simple tools that are required to fix a flat tire in the wilderness can make the difference between a pleasant ride and a long walk. The ground that it may have taken only a few minutes to cover on a motorcycle may take hours on foot, especially if you're pushing a bike and a flat tire.

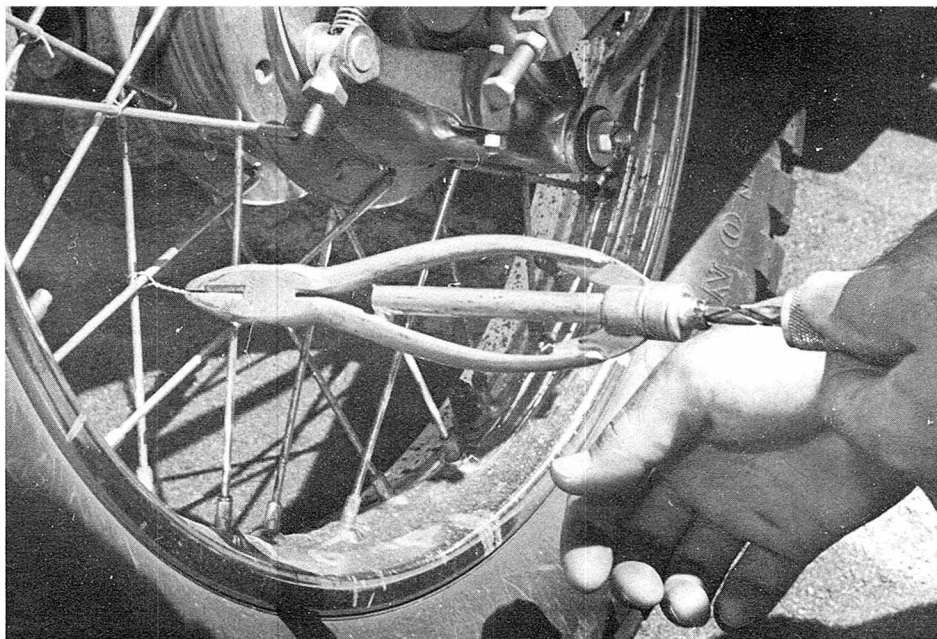
Your own experience may add most of the items to the list of backcountry problems. An individual rider or ma-



A flywheel puller such as this one is inexpensive to buy but can save many hours of wasted time at repair or tune-up time.



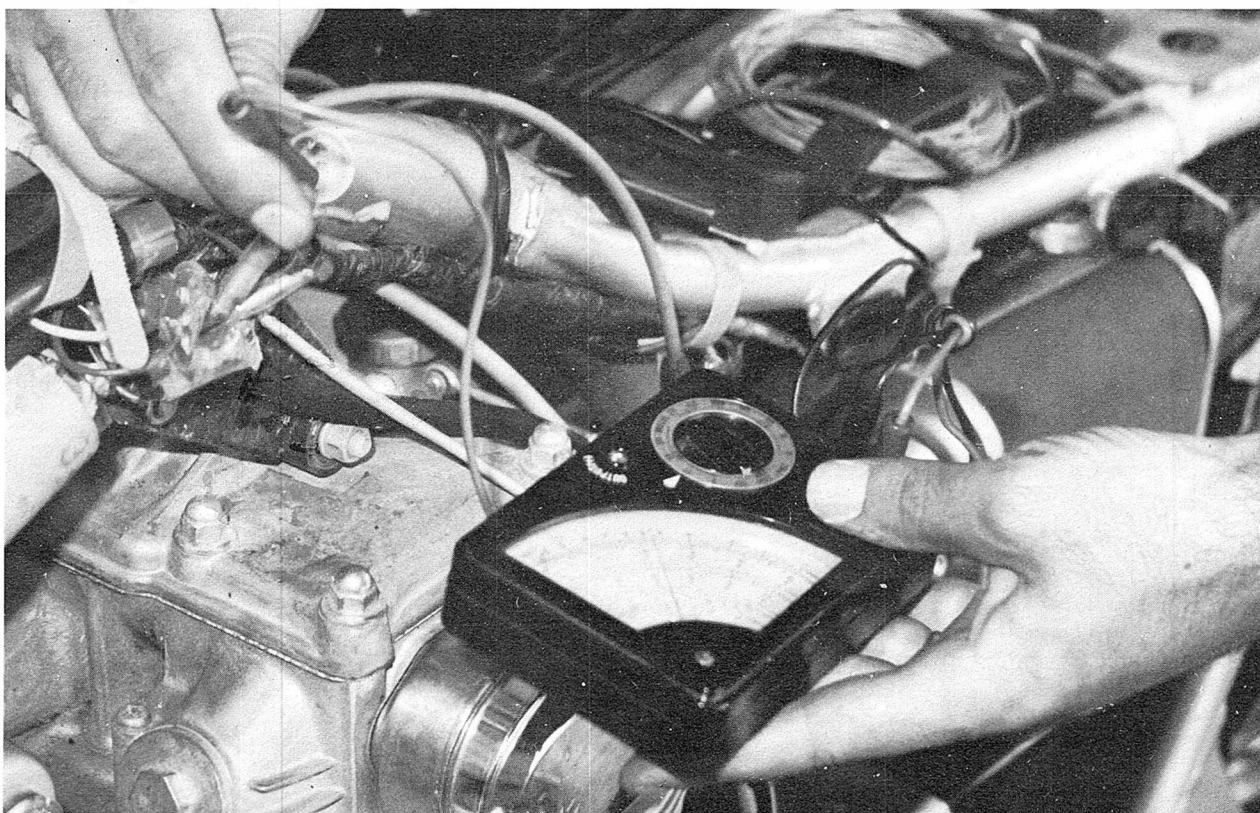
Items like this spark plug and wrench holder make it easier to carry the needed items into the backcountry.



Items like these safety wiring pliers are not necessary, but make the job neater and easier to do.

A torque wrench is a good investment if you do much teardown and re-assembly. Tightening bolts with the proper force is especially important with motorcycle parts.

This Volt/Ohm/Amp meter is not expensive to buy and can be used in many ways around the garage, for checking out or tuning up your motorcycle.



chine can also be expected to experience different problems that are related to the rider's style or the machine's special weaknesses. Once the list is clearly established, you can more easily choose the combination of tools that you may require. Since carrying space is usually limited, it may take a good deal of thought before you finally pin down the best setup for you.

Similar reasoning should also apply to the tool selection for your garage. Here space is not the real problem, but expense usually is. Start with the basic wrenches, and add sockets, and specialized tools as you go along. Such items as an impact driver, torque wrench, and several specialized pullers and gauges may be more than worth their initial cost if chosen correctly. ●

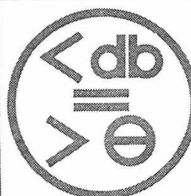


OUR BIG GUN IN THE NOISE POLLUTION REVOLUTION

In the battle against unfavorable laws, adverse public opinion, and closed-off public lands, motorcyclists have one great enemy: Noise.

And one great ally:
The Muffler.

Get behind the
muffler movement,
and keep down
the fences
by keeping down
the noise.



Join the
Noise Pollution
Revolution

See your motorcycle dealer for this
free LESS SOUND = MORE GROUND button.

SPECIAL BUYERS' GUIDE SECTION

TOTE BAGS & TOOL KITS

1.

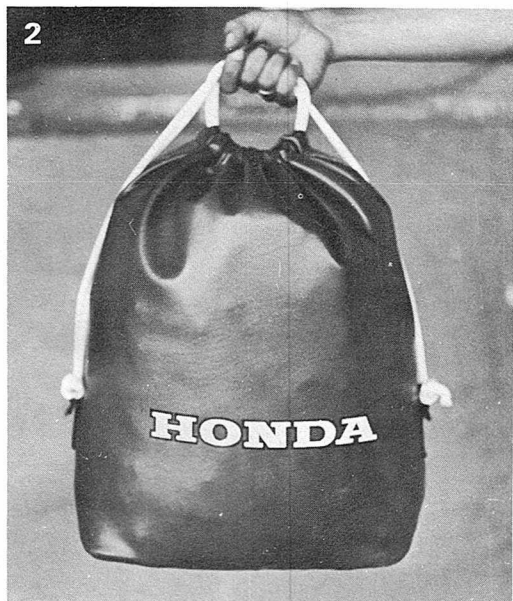
This sturdy leather Enduro Tool Kit carries all the tools necessary to keep your bike running while you're on the go. Available at Al Fox Motorcycles, 437 S. Victory, Burbank, Calif. 91502. Price is \$14.95.

2.

Honda grab bag, made of soft, tough vinyl with carpeted floor and draw-string handle. For boots, helmet, etc. Price \$8.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

3.

Endura of California presents four bags and a tool kit. Bags are made of rugged vinyl but can be gotten in leather for an extra cost. The Helmet Bag #605 (upper left) is \$9.95, the Weekender #684 is \$13.95, the smaller Weekender #607 is \$10.95. The Pillion Pack (lower left) #821 is designed to strap to the bike and is \$8.95. The Bar Bag #826 is for carrying tools and is \$4.95. Available from Endura of California, 312 S. Palm Ave., Alhambra, Calif. 91803.



JERSEYS & SOCKS

4.

Kawasaki racing jerseys made of super strong, 100% stretch nylon mesh, vented for circulation. Double elbows and shoulders. Colors: green and white, or red, white and blue. Sizes: S, M, L, X-Lg. Available at your Kawasaki dealer.

5.

Vented motocross jersey from Webco. High quality nylon is vented for comfort. Padded shoulders and elbows. Available in six colors for \$10.95. Webco, P.O. Box 429, Venice, Calif. 90291.

6.

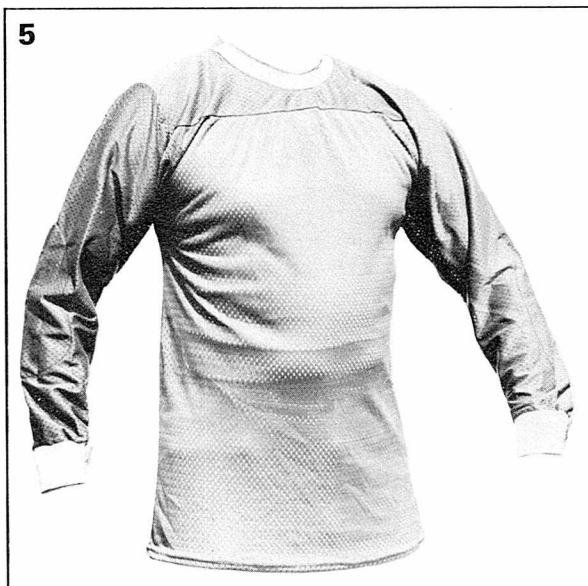
Long sleeved riding jerseys in assorted colors. Small, medium, large, X-tra large. Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

7.

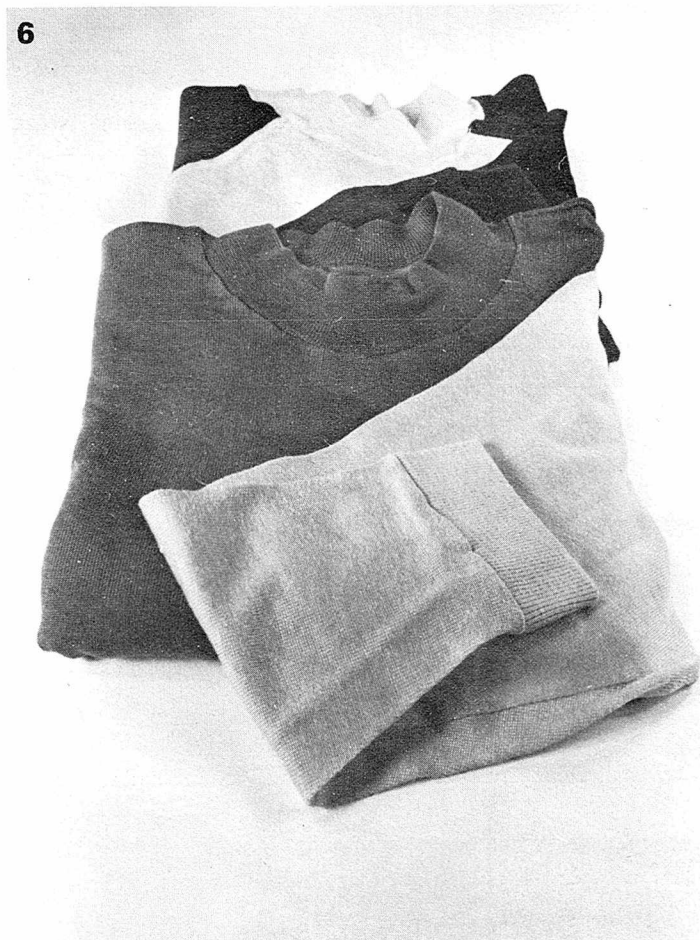
These Joel Robert endorsed motocross socks are over 30 inches long. Will fit over any boots. Thick, heavy knit fabric has plenty of elastic to give support. Come in six colors. Available from J-T Imports, 3751 Alta Loma, Bonita, Calif. 92002. Price \$5.95 pair.



5

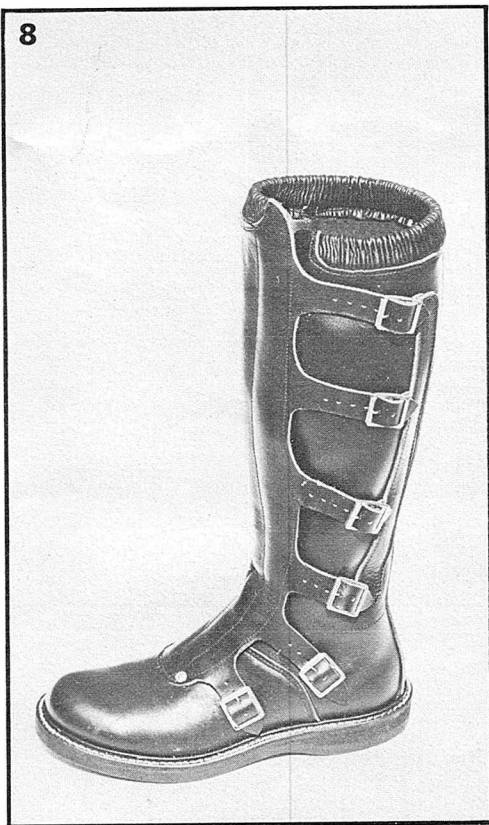


6



7





BOOTS

8. Desert-motocross boots from Webco. 16½ inches high with four pipe shin guard, padded ankle, elastisized upper band, semi-wedge sole with six quick buckles. Sizes 6 through 10 with half sizes, plus 11, 12, and 13. \$44.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

9. Top quality English leather motocross boots, comfortable and durable. Full length side buckles give maximum support for all types of racing. Sizes 6 through 12, \$38.95 from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

10. This revolutionary boot from Sunset Distributing Co. features a full length Velcro strip fastener. On and off in seconds, only one buckle at the bottom, elastic top, reinforced toe, padded shin and ankle. \$49.95 from Sunset Distributing Co., 138 W. Verdugo Ave., Burbank, Calif. 91502.

PROTECTIVE EQUIPMENT

11.

The Bell Star (left) and the new Bell Super Magnum (right) are available at Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502. The Bell Star is \$59.50, while the Super Magnum is \$49.00.

12.

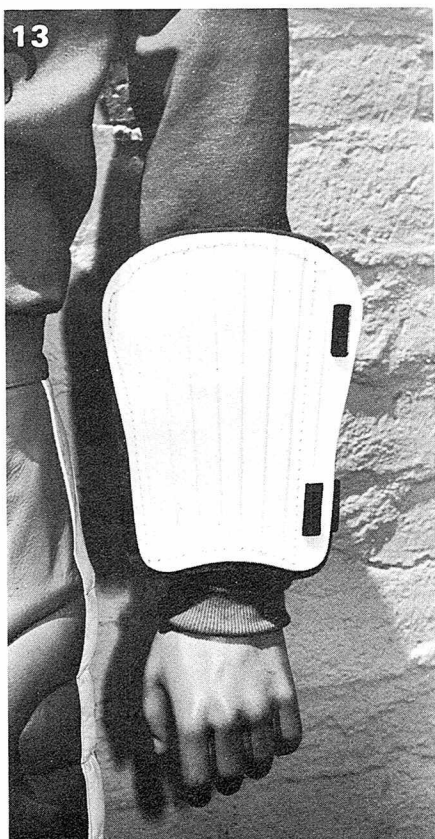
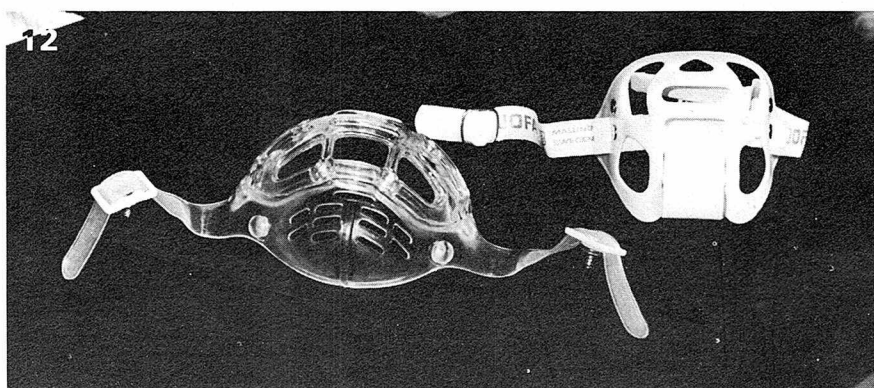
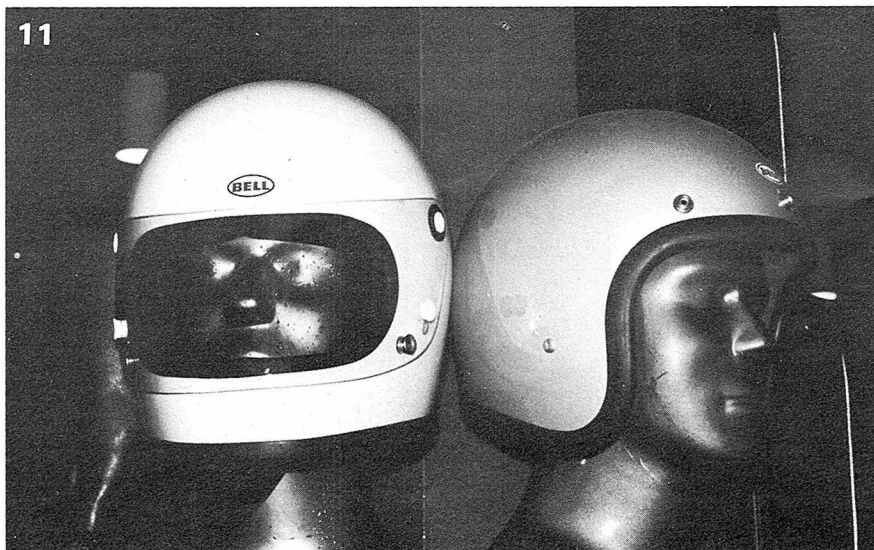
Suzuki Fun Center carries two of the most popular mouth guards on the market. On the left is the latest from Jim Davis Motosport, a super light, clear plastic, soft and comfortable. On the right is the Jofa from Sweden priced at \$5.95. Contact Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

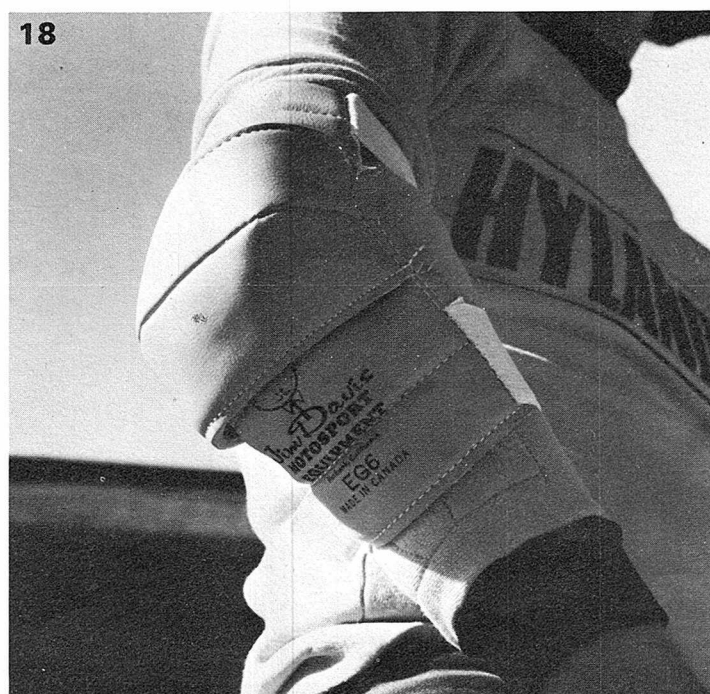
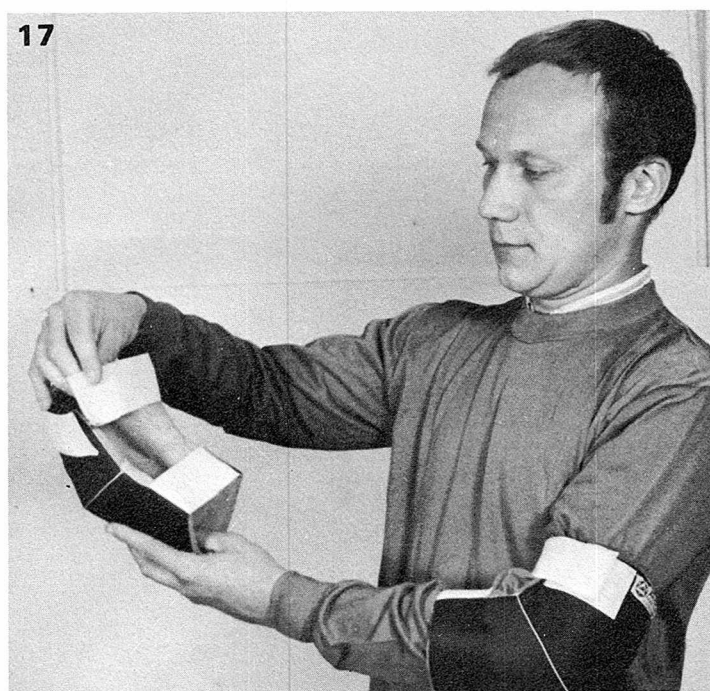
13.

The Jofa Plastic elbow and forearm guard fits well over or under your racing jersey. Sure protection for elbows and forearms for \$9.95 a set. Contact Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

14.

From Jim Davis Motosport, the latest in shoulder protection. Lightweight and padded where you want shoulder protection, on point of shoulder and outside of arm. Price \$15.73. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311.





15.
The Vizor-Vu helmet visor features a built-in rear view mirror providing three times the vision of the bar mounted rear view. Snaps on to your helmet. Available at \$6.95 from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502

16.
Jofa has also come out with this elbow pad and Suzuki Fun Center carries it. Contact them at 515 N. Victory Blvd., Burbank, Calif. 91502.

17.
Here's the new Torsten Hallman elbow guard, a lined, padded plastic cup, naturally formed for the elbow. \$16.25 a pair from Torsten Hallman Racing Inc., 5345 Timken St., Suite L, La Mesa, Calif. 92041.

18.
The Jim Davis elbow pad features a telescopic effect allowing the pad to remain flat, no bulk, well padded and comfortable on the inside. Will not ride around on your arm. Priced at \$10.78. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311

19

19.

The GP chest protector is available from Hercules for \$15.00. Contact Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

20.

Here is the Jim Davis shin and knee guard. Not a cut down version of the baseball catcher shin guard, designed specifically for the motorcyclist. Worn by many of the top professional motocrossers flat trackers. Price \$17.54. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311.

21.

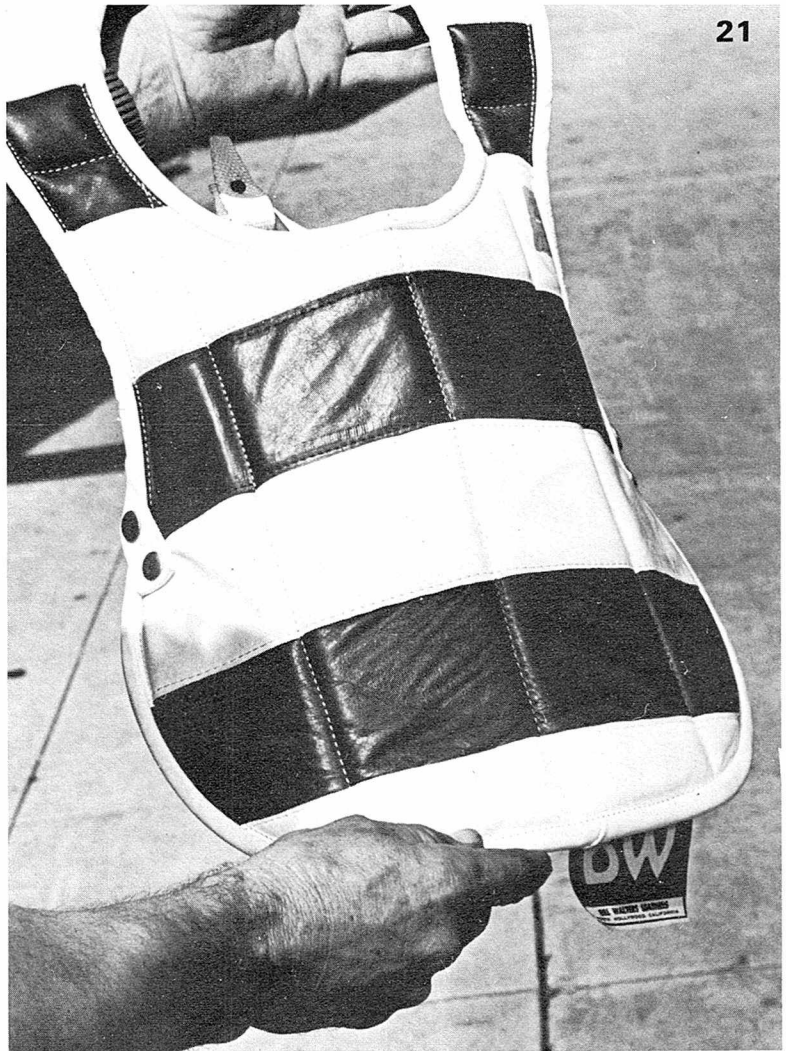
This Bill Walters chest protector is available from Al Fox Motorcycles, 437 S. Victory Blvd., Burbank, Calif. 91502. Available plain for \$14.95, or red, white, and blue, as shown for \$19.95.



20



21



22



23

24



22.

This hi-density foam rubber chest protector comes in black, green, yellow, red, or blue. Fully adjustable neck and back strap. Priced at \$14.95 from CC Products, P.O. Box 96-Dept., Rialto, Calif. 92376.

23.

The JimDavis knee pad is a lightweight pad which snaps on over your leathers, no pulling and tugging an elastic pad all day. Vinyl with foam padding on inside. Price \$6.60. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311

24.

The Jofa chest protector is available from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502. Used by many world champions, it is priced at \$17.95 with removable shoulder pads.

25.

This is the latest Jim Davis chest protector. The newest light-weight slip-on style. An attractive and distinctive yellow color, priced at \$13.70. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311.

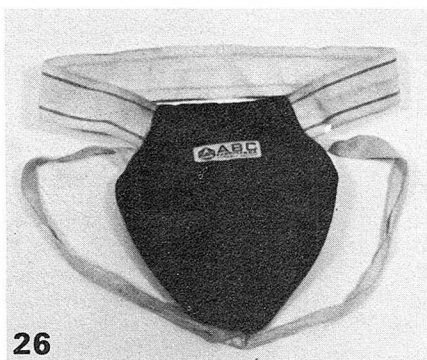
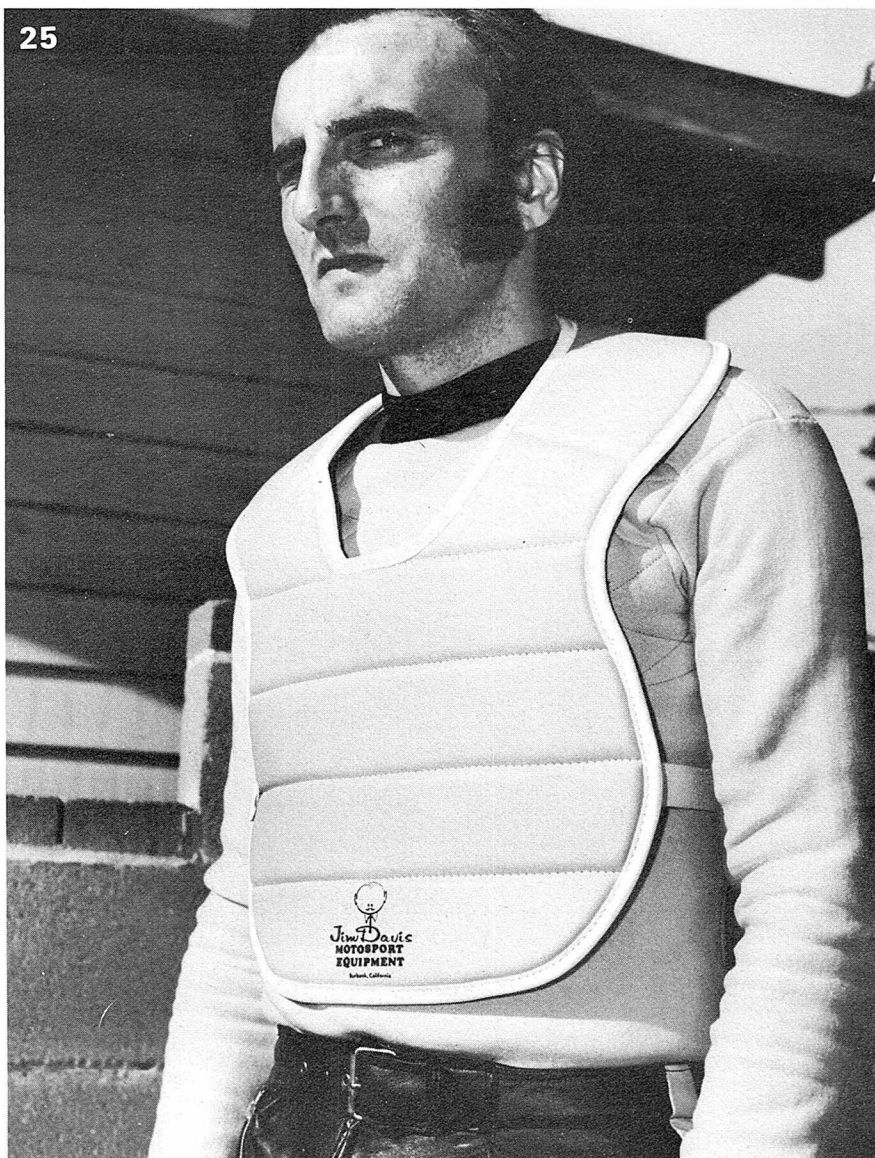
26.

The Torsten Hallman "Goodie Guard" is a plastic cup, padded and lined for comfort. Available in one size: Swedish medium. Priced at \$7.85 from Torsten Hallman Racing Inc., 5345 Timken St., Suite L, La Mesa, Calif. 92041.

27.

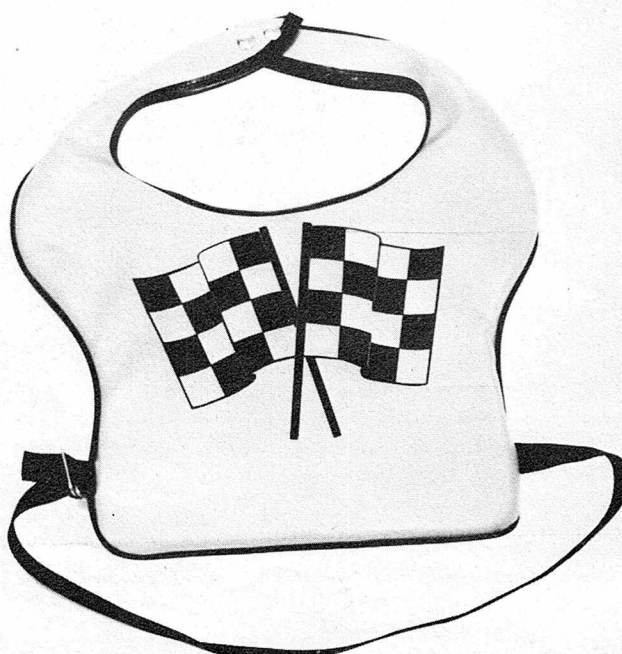
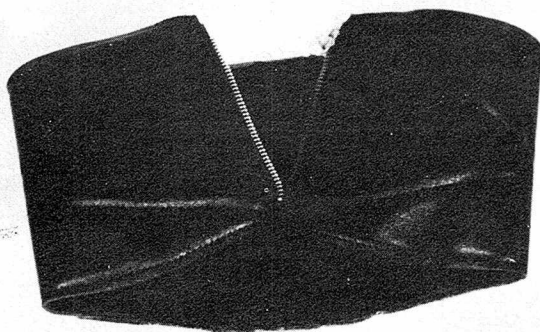
The Endura chest protector has a distinctive checkered flag emblem, simple construction allows one size to fit all, comes in eight colors and is priced at \$10.95. The motocross belt is made of vinyl with foam padded backing to support ribs and spine, price: \$10.95, sizes from 28 to 38. Contact Endura of California, 312 S. Palm Ave., Alhambra, Calif. 91803.

25



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LEATHERS

28.

European leathers from Endura of California feature Danish Roll padding, heavy duty zipper on fly, legs and rear pocket, lined in sturdy full stretch black nylon. Contact Endura of California, 312 S. Palm Ave., Alhambra, Calif. 91803.

29.

Motocross pants from Hercules Distributing Co. Available in sizes 28, 30, 32, 33, 34, 35, 36, 38, 40. Priced at \$52.00 from Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

30.

Endura has come up with a patching kit for leathers, they are no longer obsolete when torn. Available in a variety of colors, the kit is \$1.95 with extra material. Vinyl kits are available for \$.95. Contact Endura of California, 312 S. Palm Ave., Alhambra, Calif. 91803.

30



31



31.

From Endura come the "Cool Ones," these are light colored rough-out leathers designed to reduce the body area temperature by 20° over the more traditional black leathers. The Endura roughouts come in 31 standard styles and 250 miscellaneous designs. Prices range from \$17.95 to \$113.95 depending on style of garment or complete outfit. Contact Endura of California, 312 S. Palm Ave., Alhambra, Calif. 91803.

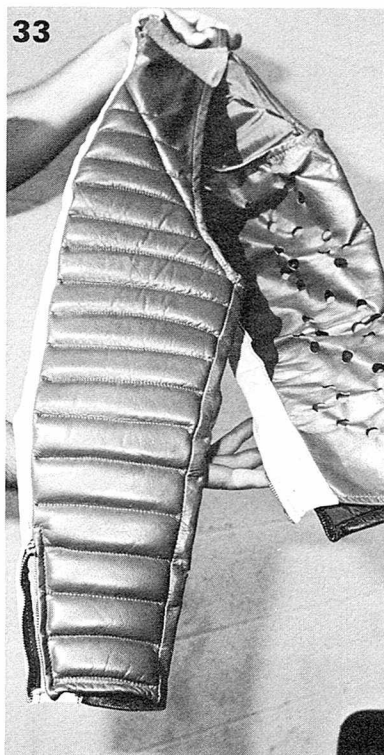
32.

Motocross pants from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502. These pants are of the highest quality Canadian steer hide, fully padded and satin lined. Sizes from 28 to 44, four color schemes. Priced at \$69.50.

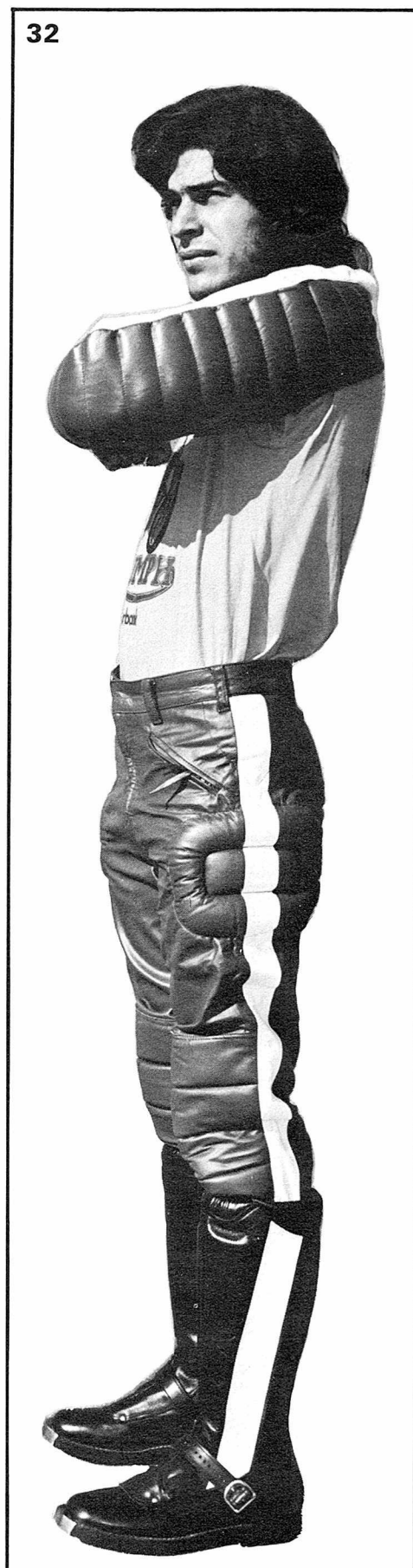
33.

Padded, lightweight leather sleeves for the racer. Vented as shown on the inside for keeping cool. Available from Sunset Distributing Co., 138 W. Verdugo Ave., Burbank, Calif. 91502.

33



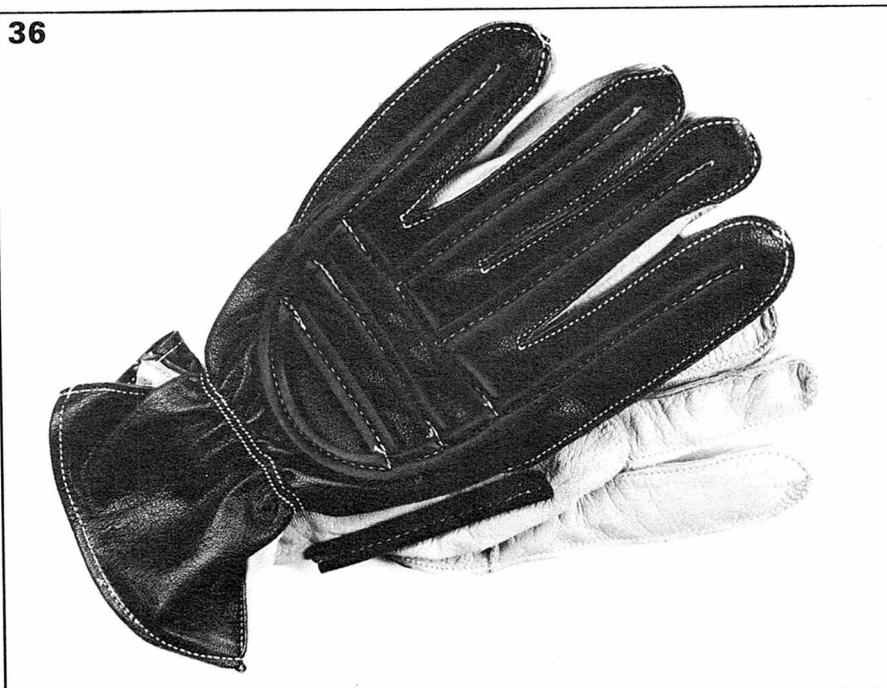
32



34



36



34.

Grand Prix motocross pants from Torsten Hallman, special motocross pants made of goat skin. A pocket in the knee contains a plastic cup for protection of this vital area. Priced at \$72.45. Contact Torsten Hallman Racing Inc., 5345 Timken St., Suite L, La Mesa, Calif. 92041.

35.

Sunset Distributing Company presents these quality motocross leathers. Soft leather, long wearing, fully padded with zipper pockets, available in variety of colors and sizes for \$59.00. Contact Sunset Distributing Co., 138 W. Verdugo Ave., Burbank, Calif. 91502.

GLOVES

36.

Motocross gloves from Hercules. Available in sizes 8, 9 and 10. Priced at \$9.95. Contact Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

GOGGLES

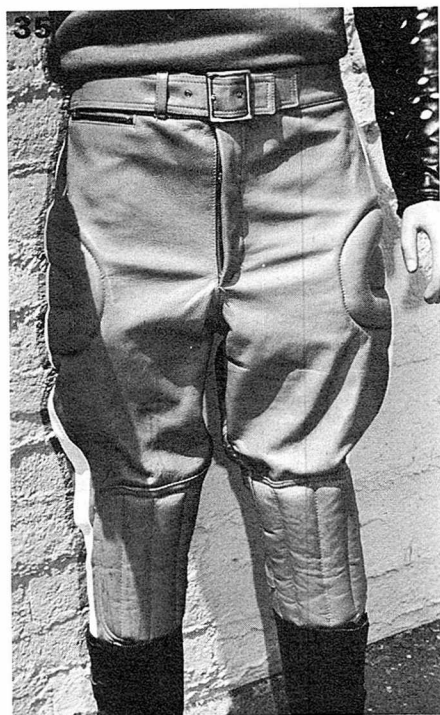
37.

These are the Carrera goggles in amber and clear lenses. Priced at \$7.45. Contact Lynn Wilson, Box 653, Chatsworth, Calif. 91311.

38.

Hercules racing goggles are available in three lenses, clear, smoke and amber. Priced at \$2.90. Contact Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

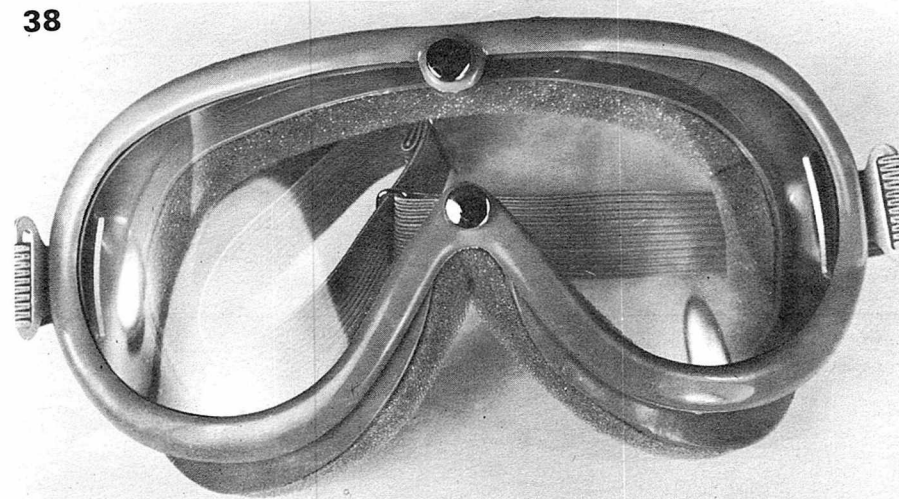
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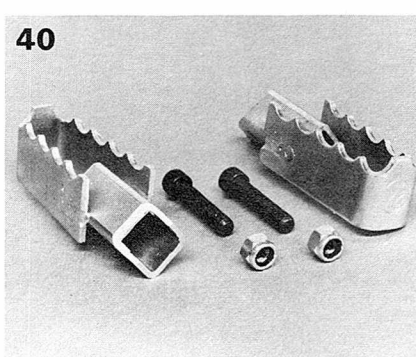
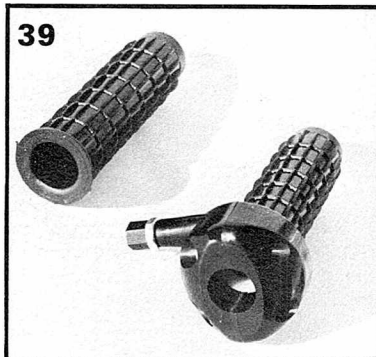
GRIPS & FOOT PEGS

39.

Nylon quick throttle from Webco is ideal for all applications requiring responsive and sensitive throttle control. Comes with cable adjuster and two soft rubber grips. Price \$6.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

40.

The Webco motocross pegs are heat treated steel, with positive grip, self cleaning, eliminate slipping in wet riding. Designed for racing and fast trail riding. \$8.95 a pair for most models from Webco, P.O. Box 429, Venice, Calif. 90291.



FENDERS & ACCESSORIES

41.

Motocross fender brace from Webco. Designed for the Yamaha, available for other models. Polished alloy easily attaches to most triple clamps, drilled for lightness and appearance. Priced at \$13.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

42.

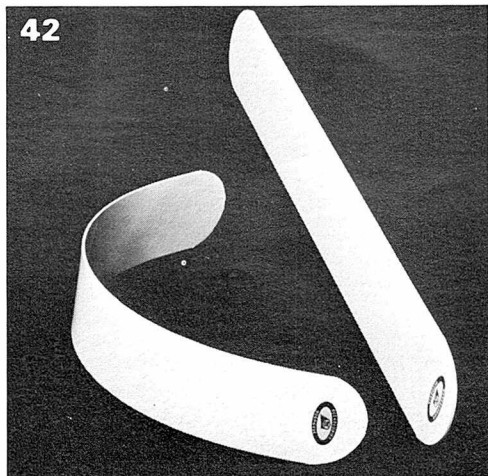
This flat fender from Accurate Accessories is lightweight yet sturdy. Great for any competition or everyday road riding. Price \$2.95 from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

43.

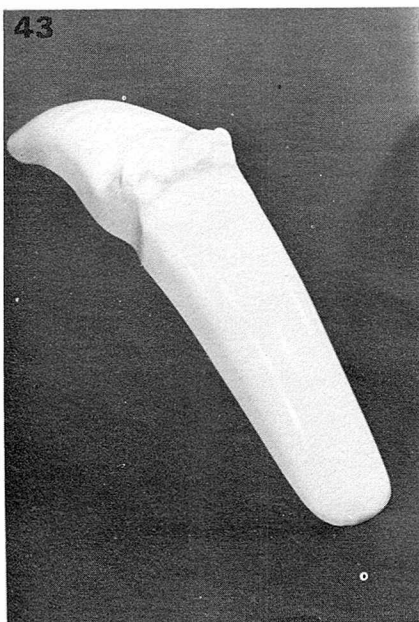
Steen's has an unbreakable fender for Ceriani forks. Front fender is most susceptible to breaking but this space age plastic, Cylolac is vacuum formed to shape and springs back immediately after impact. White on left is for the C-1000 fork, the blue on the right is for the C-4000. Priced at \$15.95 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.



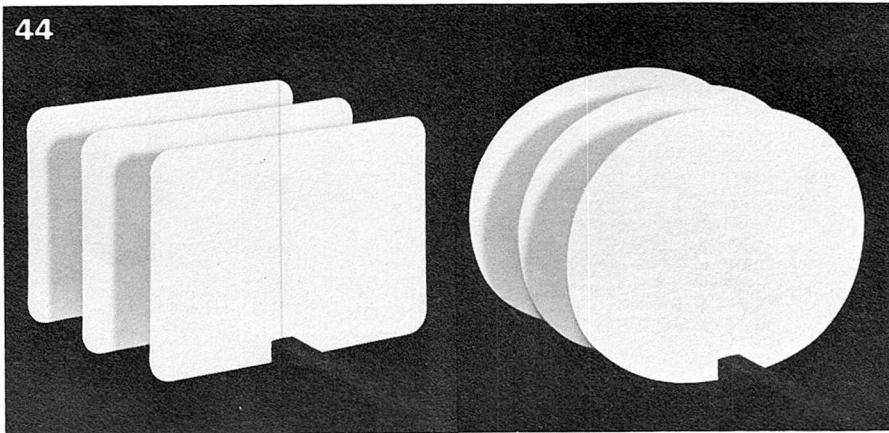
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43



44

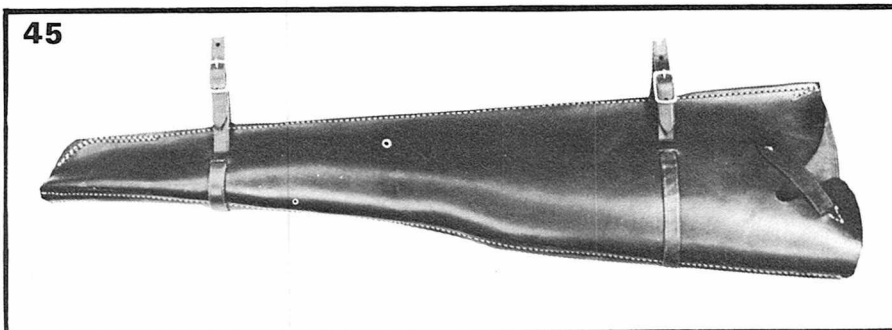


NUMBER PLATES

44.

Number plates from Accurate Accessories, in the motocross oval and AMA rectangular, white only. Come in sets of three, 7x10 at \$3.35 per set, 10x12 at \$3.95 per set. Contact Accurate Accessories 4347 Imperial Highway, Lynwood, Calif. 90262.

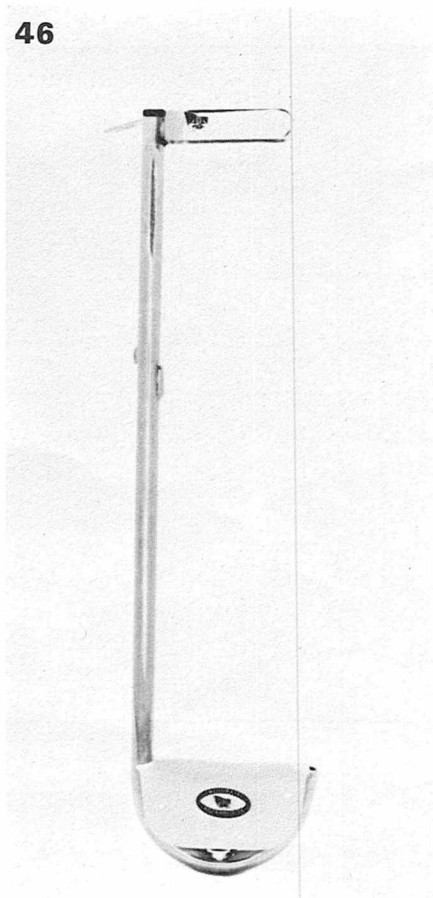
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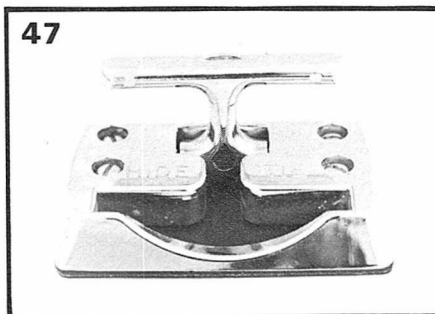
45.

From Accurate Accessories comes the rifle carrier, an oiled leather scabbard with waxed linen thread stitching for carbines and shotguns, also available for bolt action. Priced from \$14.75 to \$22.95 depending on model desired. Contact Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

46



47



46.

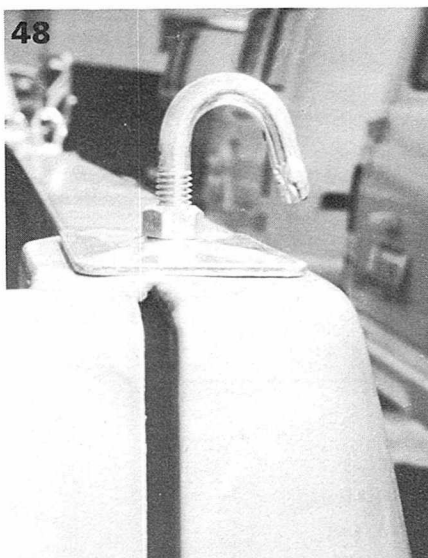
This is the practical Rifle Carrier for telescopic front suspensions. Designed to mount easily with the finest materials available. Priced at \$13.95 for most models from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

TIE DOWN ANCHORS

47.

The Hide-A-Tie eliminates running into something sticking out permanently in the way. Bolts easily and securely into place, lies flat in case when not in use. Priced at \$3.50 from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

48



48.

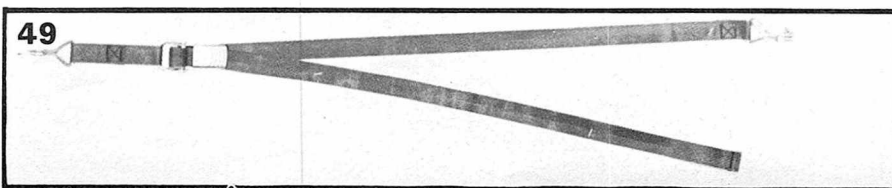
This rope hook has no holes to drill, anyone can install in minutes. Fits in stake holes. Solves tie-down problems, made of heavy duty steel. From Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262, priced at \$2.95.

TIE DOWNS

49.

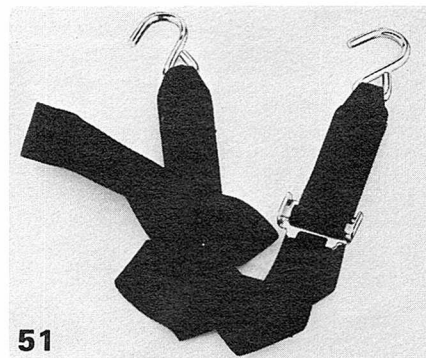
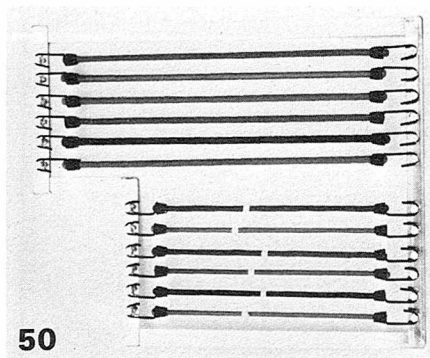
Ezee Straps, nothing to add, no knots to tie. Quickly adjustable with self-locking buckles. Multi-purpose tie-down can be used for cinching many types of loads, in four colors. Cost \$7.95 from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

49



50.

These elastic straps are attractive and durable, with plastic covered metal hooks to prevent scratching. Excellent for securing parcels to motorcycles, lengths 18 and 24 inches. \$.22 each for the 18 inch, and \$.28 for the 24 inch. From Accurate Accessories, 4347 Imperial Highway, Lynwood, California 90262.

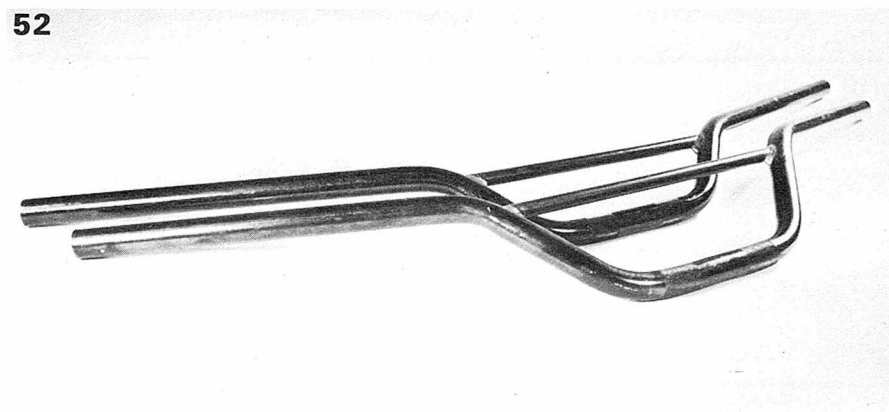
**51.**

These rugged tie downs keep your bike in place while you are hauling it. Colorfast black straps are aircraft quality 2 inch wide webbing, 14 to 56 inches. Priced at \$8.95 per strap at your dealer, or contact Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

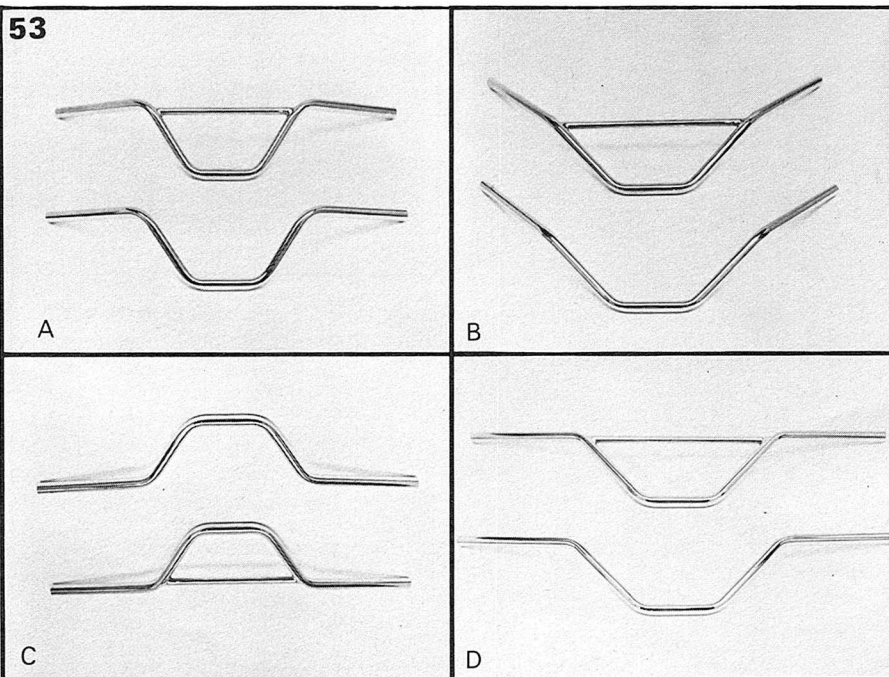
HANDLEBARS & ACCESSORIES

52.

Hercules motocross bars, 3 and 5 inch, made of high quality steel, cost \$11.95 from Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

**53.**

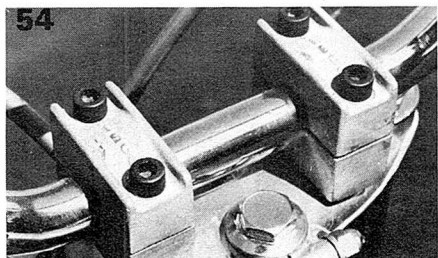
The Accurate Accessory handlebars are made of 7/8-inch heavy duty tubing. Styles shown are A) Universal, B) Long Horn, C) Desert Scrambles and D) Wide One. Bars are priced at \$8.95 without the brace, \$10.95 with the brace. Contact Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

**54.**

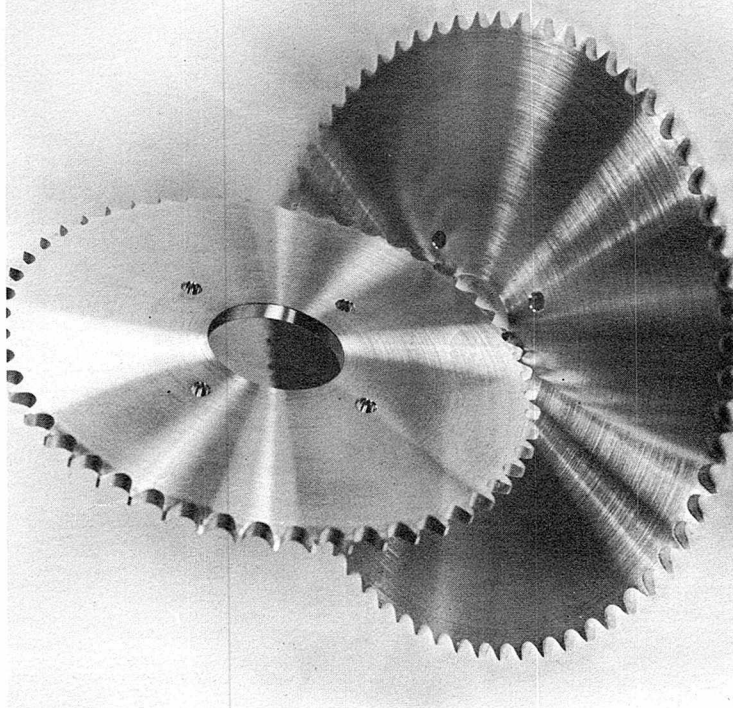
Alloy handlebar mounts, made from cast aluminum mounts to top triple clamp. A rigid handlebar mount ideal for all types of riding. Single bolt mount \$6.95 a pair, double bolt mount, \$5.95 a pair from Webco, P.O. Box 429, Venice, Calif. 90291.

55.

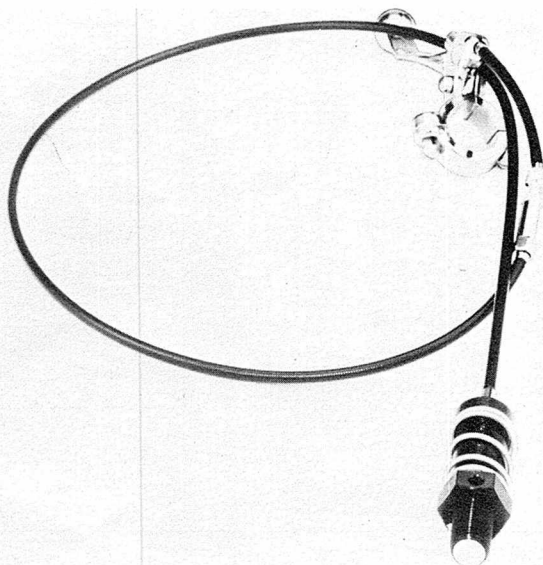
Miniature swept back bars for Yamaha Mini-Enduro. For the little dirt track riders. Bars measure 28½ inches end to end. They come in competition black oxide and cost \$9.95 from K&N Engineering, P.O. Box 1329, Riverside, California 92502.



56



58



59



57



MISCELLANEOUS ENGINE COMPONENTS & PARTS

56.

Alloy rear sprockets for Puch and DKW, sizes 52 through 68. \$14.95 from Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

57.

The Van Tech Power plate for Suzuki 90s increases power and torque in all TC and TS 90s. Improves air flow to the carburetor. Costs \$10.95 and is available from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

58. X

A better way had to be found of preventing dirt intake, replacing wire screens, oil soaked mesh pads, and plastic foam. That better way is the MX-5 compression release. Guaranteed by the manufacturer, this unit costs \$18.95 and is available from MX Precision Shop, 1069 East Edna Place, Covina, Calif. 91724.

59.

The rotary valve engine filter is a must for all rotary valve engines. Completely washable and long lasting. Any rotary valve engine can have extra filtering with the K&N side breather. Available for \$5.95 from K&N Engineering, P.O. Box 1329, Riverside, Calif. 92501.

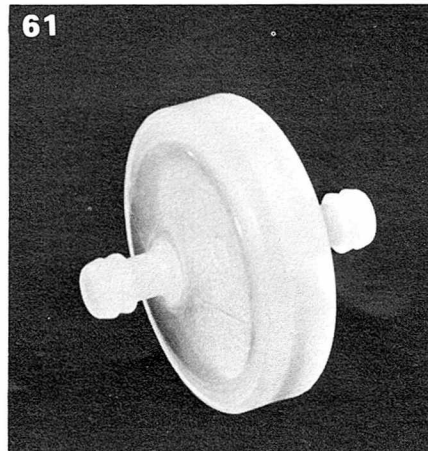
60.

No loading with this drain for the Amal Concentric carburetors. Perfectly matched replacement for the standard float bowl but with a large screw at the bottom to dump fuel if the engine loads up. Priced at \$5.95 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

60



61



61.

This fuel filter is quick to install, disposable, a ceramic filter. Priced at \$1.00 from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

62.

The all new Cycle Coolers are now available from Thermo-Chem Corporation. They manufacture a complete line of engine and transmission oil coolers. Model CC 101 fits Harley, BSA, Triumph, and Norton. Model CC-102 fits Honda 350, 500 and 750. Model CC-103 fits Yamaha 650. Models 101 and 103 cost \$54.95, model 102 costs \$59.95 from Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

CONTROL ACCESSORIES

63.

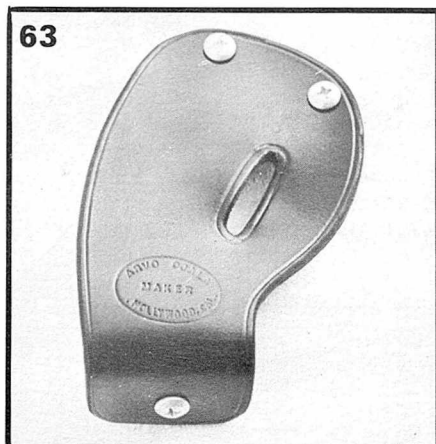
Husky shift lever cover is formed to fit case with shift lever fitting through pre-cut slot. Protects ankle and boot from wear against lever. Priced at \$5.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

64.

The cross bar pad protects rider against injury resulting from hitting cross support of motocross style handlebars. Snaps on in seconds to any handle with cross bar, padded with cushioned foam rubber. 12 inch pad costs \$3.95, 8 inch pad for \$3.25. Available from CC Products, P.O. Box 96, Rialto, Calif. 92376.

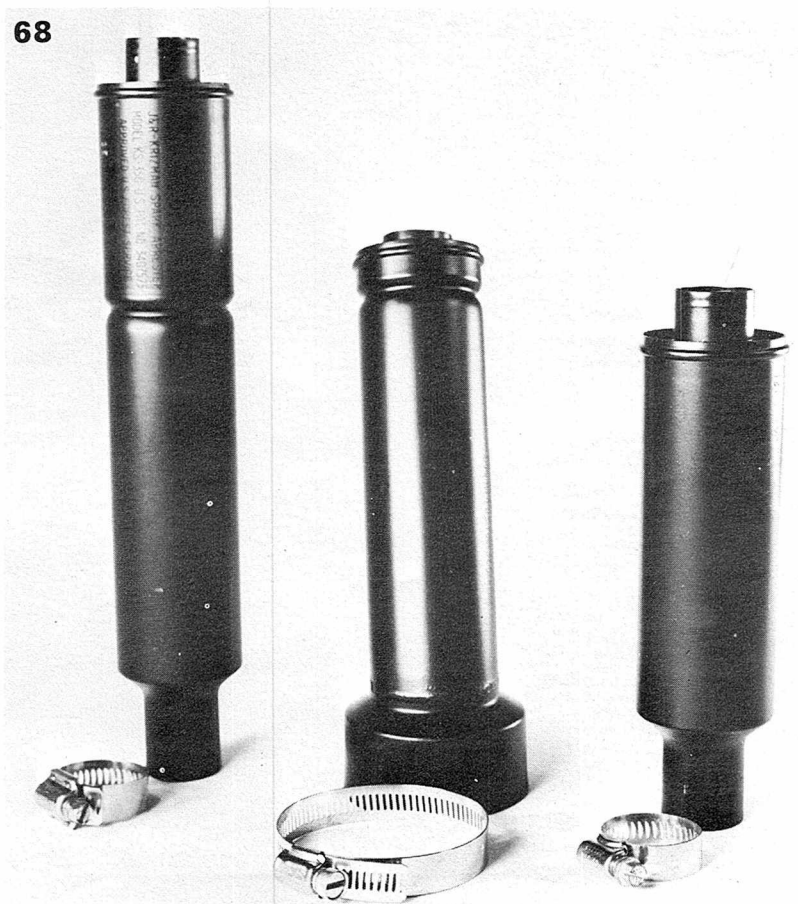
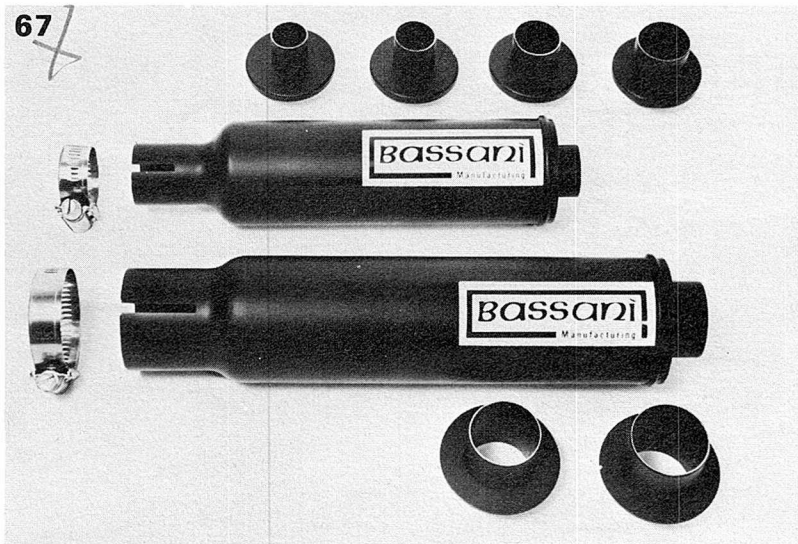
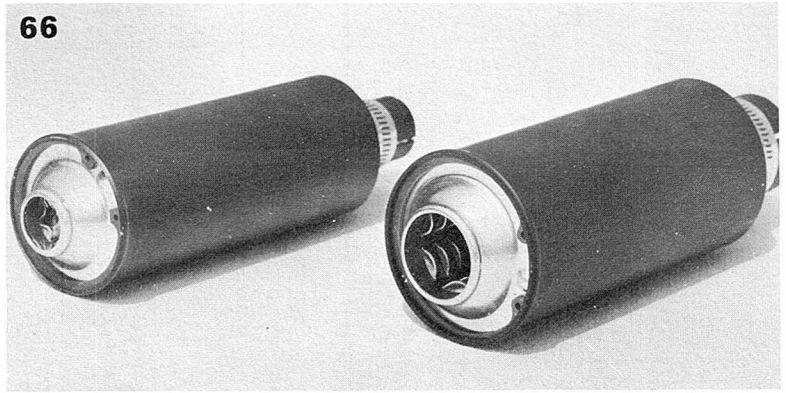
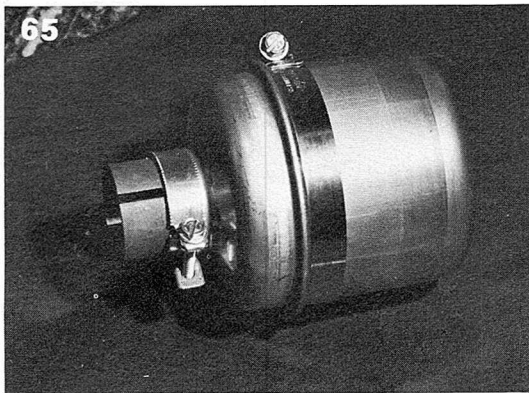
62

63



64





SILENCERS & EXHAUST SYSTEMS

65.

The Gill Spark Arrestor, one of the first spark arrestors approved by the Forestry Service. Good for either two or four stroke engine, fits 1 5/16 inch pipe. Price \$13.50 from Webco, P.O. Box 429, Venice, Calif. 90291.

66.

The Skyway combination silencer/arrestor is fully approved by the Forest Service, offers largest cubic-foot-per-minute flow of any arrestor combination on the market. Silencer only \$14.95, silencer/arrestor combination \$24.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

67.

Mini bike exhaust silencer. Originally designed for hi-performance competition motorcycles, the Bassani tuned silencer is now available for all mini bikes and other small engines. For two and four stroke engines, sizes from 3/4" to 1 3/4" priced at \$12 from Bassani Manufacturing, 1117 Fountain Way, Anaheim, Calif. 92806.

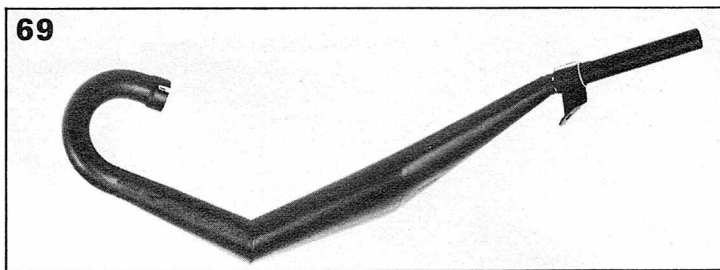
68.

Hercules J&R silencers and spark arrestors, silencer \$9.95, combination silencer/arrestor \$15.95. DKW-E Spark arrestor for 1971 DKW Enduro model \$15.95 from Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

69.

Now there is a high pipe for the Rickman Micro 125. A most successful bike on the desert and motocross, but the engine was exhausted through a low slung chamber to ease the routing and reduce weight, pipes took a pounding, but now the pipe is routed over the top of the engine. Dyno proven, \$48 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

69



70.

The Decibel Tamers from Master Products are the Soundmaster Silencers, glass packed for sound absorption. Three sizes available, three models, for up to 250, 250-400 and over 400. Priced at \$8.95 for the smaller unit, and \$9.95 for the larger units from Master Products, 13040-B Los Nietos Road, Santa Fe Springs, Cal. 90670.

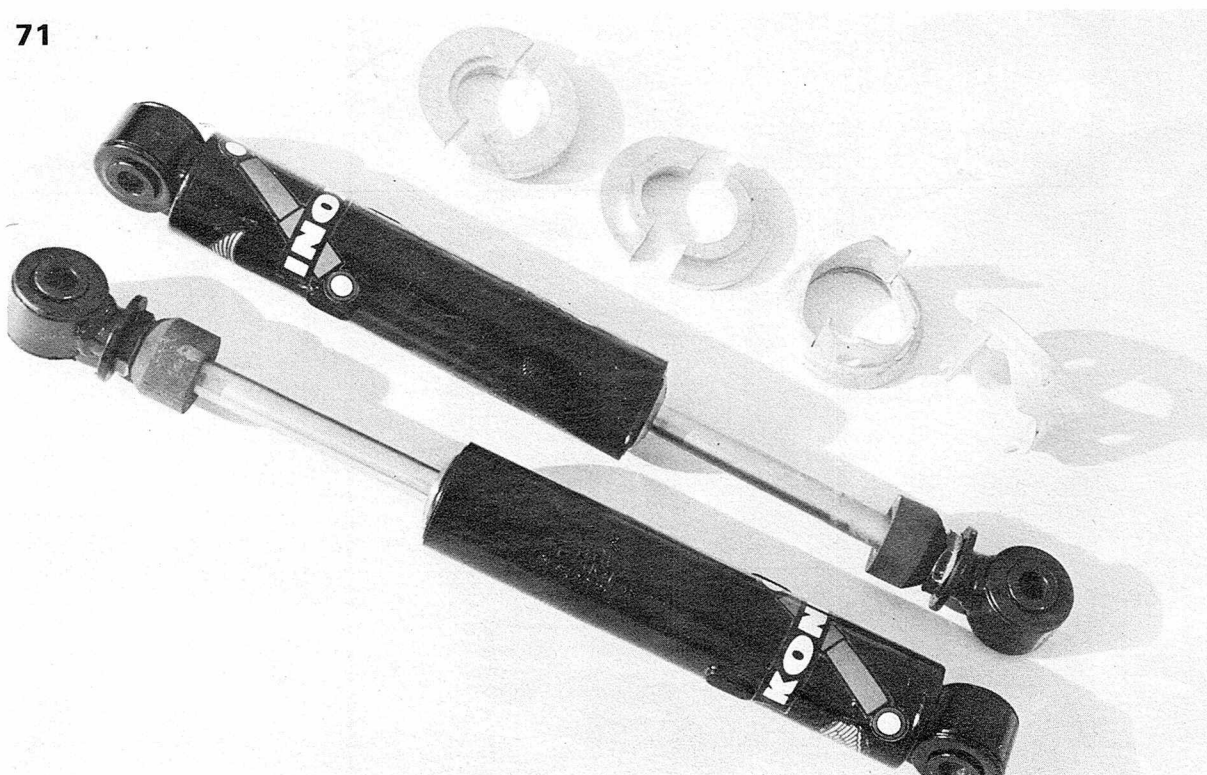
70



SHOCKS & FORK KITS

Koni adjustable shock absorbers are the choice of automotive and motorcycle racers throughout the world. Permanently sealed against road dirt, aeration and moisture. Six adjustments, \$24 from Webco, P.O. Box 429, Venice, Calif. 90291.

71





MARZOCCHI



Mexican-Italian get together with C-4000 Ceriani forks on the Carabela. The conversion is now available to Carabela owners from stock rather than being made up specially as at first. Kit complete with all hardware is \$122.86 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

Great new suspension from Italy. Equal in quality to the most famous Ceriani, their fork is standard equipment on Ducati, Benelli, Moto-Guzzi. Three sizes available, cost \$109, \$99 and \$89. Contact Speedcenter U.S.A., P.O. Box 470, Burbank, Calif. 91502.

74.

Neoprene rubber fork boots. Premium quality materials assure lasting service. Highly resistant to ozone and other elements commonly affecting the life of rubber products. For all unit Triumph and BSA through 1967. \$3.95 a pair from Webco, P.O. Box 429, Venice, Calif. 90291.

75.

Kawasaki F5, F8, F8-A F9, F81M Handling kit has shown ability to perform in such races as the Baja 1000 and the Mint 400. Contains new piston and valve assembly, new restrictor tubes, a set of S&W progressive wound fork springs and Webco super seal ERP fork boots. \$39.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

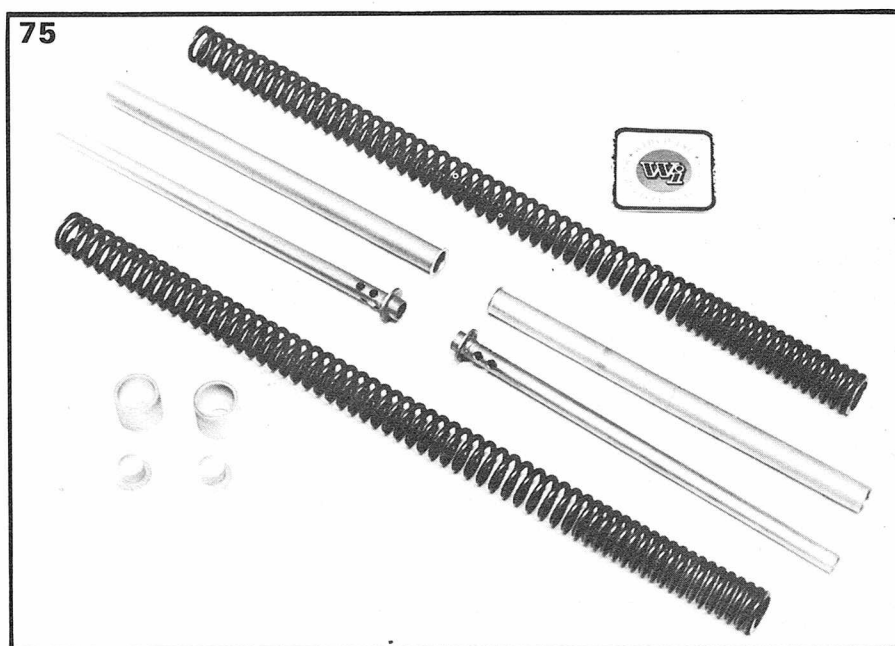
74



76.

It seems that folks a little bigger than kids were riding the Steen mini cycles, putting quite a strain on the front suspension. So Steen has a conversion kit to improve and protect the forks, for the new X-100 Mini-Motocross, also available for the older F-100 model. \$3.95 from Steen's, 1635 Valley Blvd., Alhambra, Calif. 91803.

75

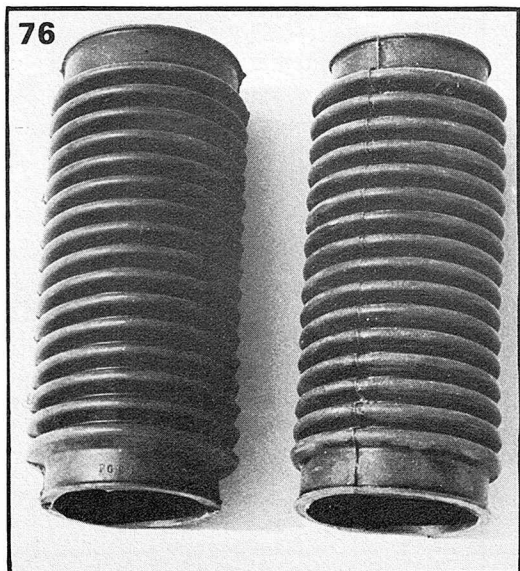


TOOLS & RAMPS

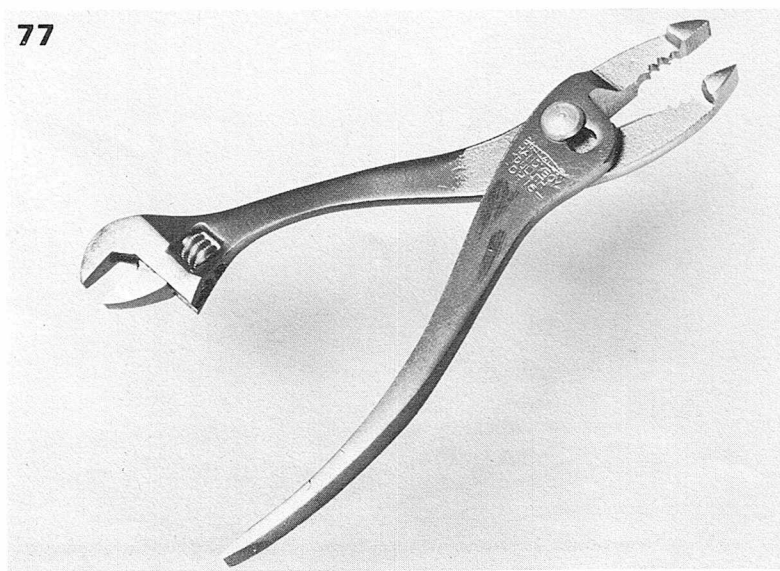
77.

The Handyboy pliers is a four-in-one tool, plier, crescent wrench, wire cutter and slot screwdriver. \$4.94 from Webco, P.O. Box 429, Venice, Calif. 90291.

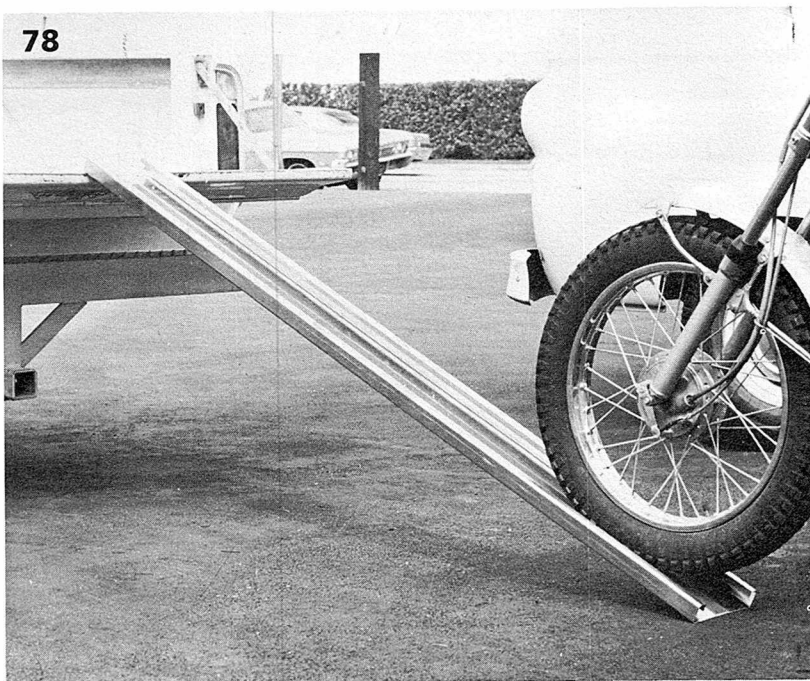
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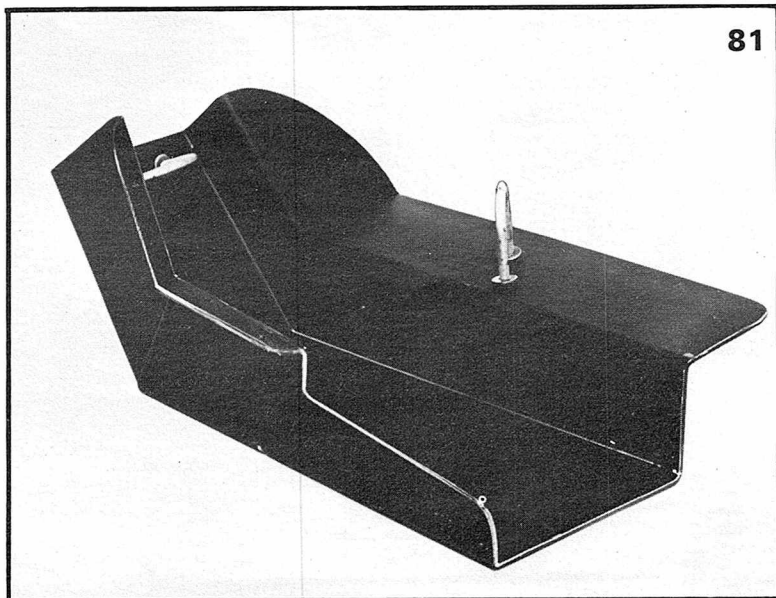
78.

This lightweight loading ramp was designed expressly for loading motorcycles into pickup trucks and vans, non-skid surface with 5½ wide channel, six feet long weighs only six pounds. \$15.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

79.

From J-T comes the fast fill refueling units as seen around the pits at the Baja and Mint races. Will flow its 2½ gallon capacity in just 8½ seconds. High quality fiberglass sealed to eliminate dangerous fumes. 2½ gallon size is \$49.25, optional 4 gallon capacity, \$59.25, stand is \$5.85 and red or blue color is \$5.00 extra from J-T, Box A, Bonita, Calif. 92002.

81



80.

Colortune is a combination sparkplug and engine analyzer that lets you read whether your mixture is rich or lean, condition of valves, gaskets and ignition. Compare the color and firing pattern on the used plug with the charts given with the tool. \$24.95 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

SKID PLATES

81.

The Case Gard skid plate from Steen's. Made of .120 inch steel plate, weighs 8 pounds including hardware. \$28.18 from Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

82.

Honda SL-350 K1 skid plate. Lightweight 3/16 alloy plate features heliarc welding throughout, custom made for Honda. \$19.95 from Webco, P.O. Box 429, Venice, Calif. 90291.

GAS TANKS

83.

The very newest desert gas tank from Webco, the DT1. Contact Webco, P.O. Box 429, Venice, Calif. 90291.

84.

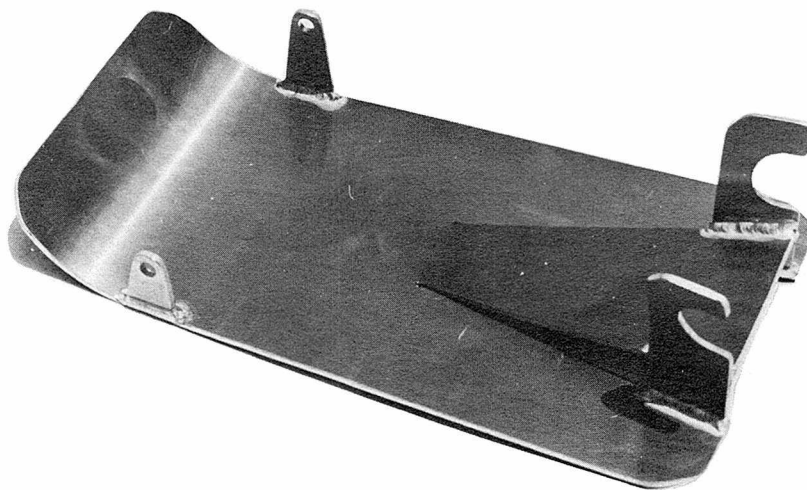
Hercules gas tanks, \$49.95, comes with 2 pet-cocks. Contact Hercules Distributing Co., 9827 Mason, Chatsworth, Calif. 91311.

SMALL ACCESSORIES

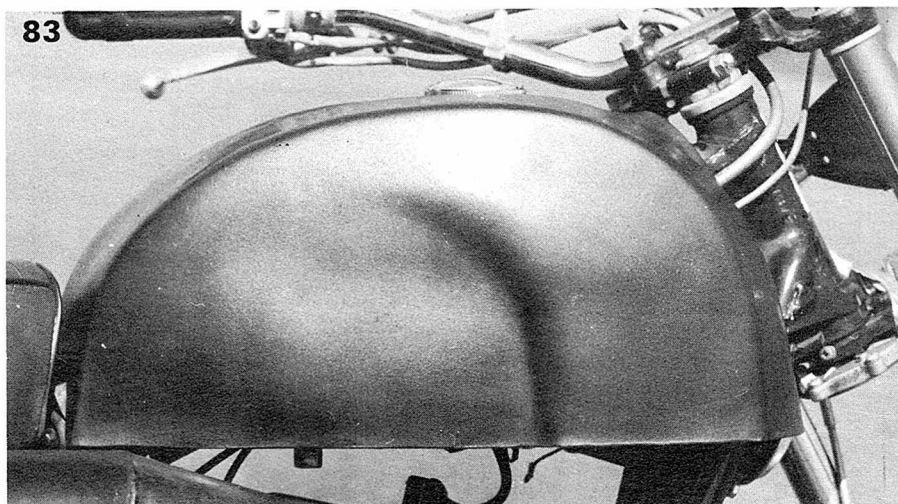
85.

To switch the Honda ignition switch to within easy reach of the rider's hands. S&S Engineering has produced two styles of plates blanketing the Honda line permitting easy transfer of the stock switch to the top of the steering head. One plate fits the CL 175 up to the CB 350, and the other fits the CL 450 up, includes the Suzuki X-6. Plates are \$2.49 at dealers, or contact S&S Engineering, P.O. Box 1646, Thousand Oaks, Calif. 91360.

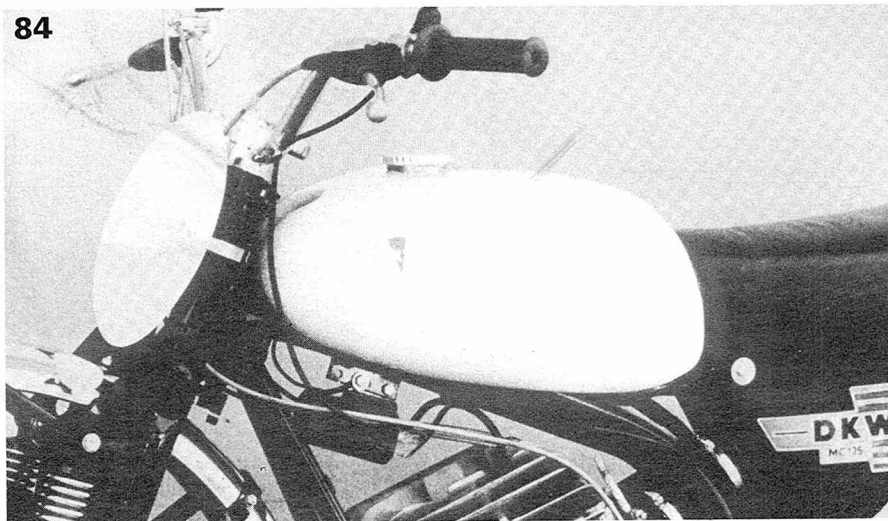
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SWITCH PLATE
CL-175 CB-175 CL-350 CB-350



SWITCH PLATE

CL-175 CB-175 CL-350 CB-350

SWITCH PLATE

CL-175 CB-175 CL-350 CB-350

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SWITCH PLATE
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86

MAGNETIC DRAIN PLUGS

\$1.95
plus tax

FITS MODELS
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750, 305, 250, 175, 160,
C200, C100, 590,
C450, 51.70
OSSA
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**REMOVE
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PARTICLES
FROM YOUR
ENGINE OIL**

**HELPS STOP
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ENGINE WEAR**

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A MUST
FOR ALL

A PRECISION TOOL MADE FROM HARDENED STEEL
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88

HAND HANDLER

QUIK STIK

89

Universal Survival Kit
Instruction Booklet

SPACE RESCUE BLANKET
SIZE: 50" x 60"
Expandable.

STEERO. BEER

ASPIRIN

QUICK STIK

86.
Magnetic drain plugs attract particles too small to miss the screen filters. Every time you drain the oil, clean the metal residue from the magnetic plug. Plugs fit a variety of bikes, available at your dealer for \$1.95 or contact S&S Engineering, P.O. Box 1646, Thousand Oaks, Calif. 91360.

87.
S&S presents the world's smallest chainbreaker, made of case hardened steel, it fits chains of all sizes, the bolt that pushes out the pin will fit most common size American and foreign wrenches. Priced at \$3.95 at your dealer, or contact S&S Engineering, P.O. Box 1646, Thousand Oaks, Calif. 91360.

PERSONAL COMFORT KITS

88.
The Hand Handler from J-T is just the thing for the rider with tender hands. Used by many of the top pros in such races as the Baja and the Mint., the cushion material along with the Quik Stik liquid will give you comfortable hand protection all day. \$3.90 from J-T Racing Imports, Box A, Bonita, Calif. 90022.

89.
This very handy Universal Survival kit contains 18 items essential to your survival should you ever need it. Refills are available and the kit is available at Suzuki Fun Center, 515 N. Victory Blvd., Burbank, Calif. 91502.

STICKERS & PATCHES

90.

Insignias, stickers, names for almost every make possible. Prices vary from \$.60, \$.99 to \$1.50 from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

91.

Quality embroidered emblems of your favorite motorcycle for your jacket, shirt or sweater. \$1 each, any 6 for \$5, any 20 for \$15. From Racecrafters International, 7920 Sunset Blvd., Hollywood, Calif. 90046.

90



91



LIQUID APPLICATIONS

92.

Four liquid application from Accurate. A) Lube Rite for roller chains on motorcycles, mini-bikes, \$.59. B) Electric Contact and Chain Klean for all types of roller chain, \$2. C) Spark Plug and Contact Klean, spray on, runs off, rapid evaporation, \$1.50. D) Chain Life, lubricates, silences, cleans, \$1.50 and \$3.00. All from Accurate Accessories, 4347 Imperial Highway, Lynwood, Calif. 90262.

93.

Steen has come out with a new fork oil, Steen C. Available in pop-top 16 oz. cans is sold by dealers everywhere or contact Steen's, 1635 W. Valley Blvd., Alhambra, Calif. 91803.

94.

Bailey's new black is beautiful. Bailey's exhaust pipe paint in aerosol cans makes it possible for you to apply it anywhere, anytime. Smooth, fast finish, dissipates heat evenly. 13 oz. can is \$1.95 at your dealer, or contact Bob Bailey, 17124 S. Western Avenue, Gardena, Calif. 90247.

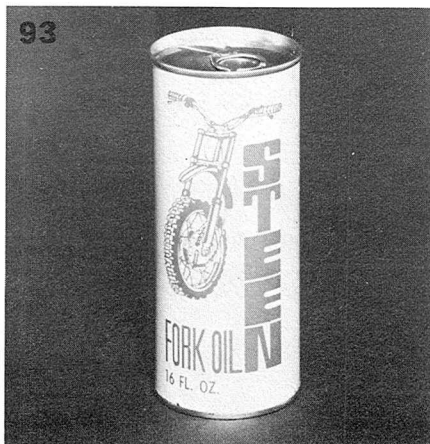
92



C



93



94



WHAT'S GOING ON HERE?

**It'll Cost You Only \$2
To Find Out...**

**And Maybe \$100.
If You Don't!**

THINK ABOUT MONEY. Then think about how you spend it on your bike. Tuneups, repairs, other maintenance. And maybe you want to make some modifications — who pays? You do!

Not just for the necessary parts, but for labor. Then there's the time you lose while your machine sits in the shop. Finally, there's the repair that isn't right... you're not sure just what is wrong, but it doesn't run the way it did — or doesn't come square out of the turns. Something isn't fixed right, but you can't put your finger on it, and you're stuck. Back to the shop, and more bills.

CYCLE MECHANICS is written to end your troubles. Clear, informative articles with lots of pictures will give you insight into your bike's working parts. Tuneups, overhauls, modifications are covered for you. All makes, and all models.

SO NOW YOU CAN CHOOSE. Maybe you want to do it yourself, or maybe you're content to lean over your friendly mechanic's shoulder. Either way, you'll know what's going on, right or wrong.

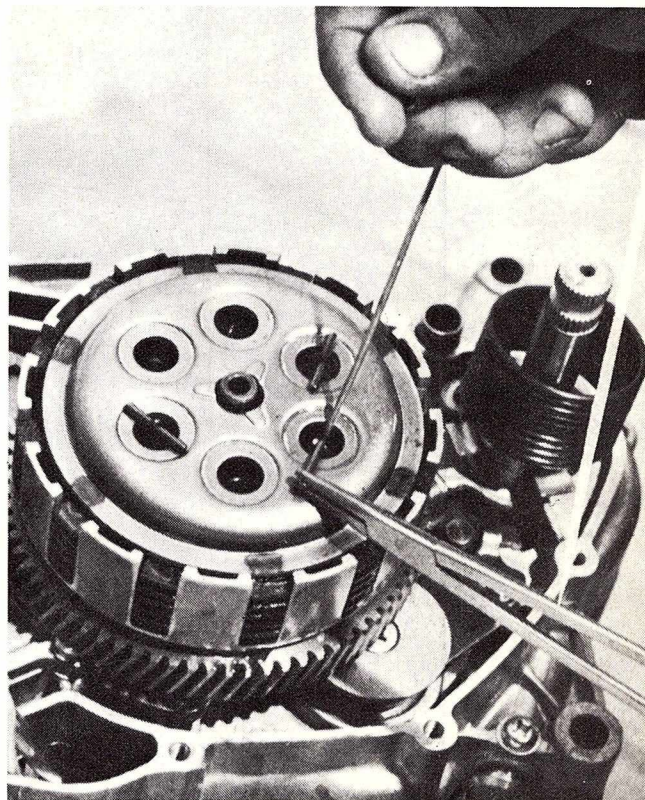
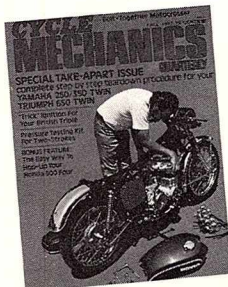
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